SOUTHERN SUBURBAN PROBLEMS AND ACHIEVEMENTS

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MODERN TRANSPORT

"THE TIMES" OF THE TRANSPORT WORLD

QUADRUPLING THE GREAT NORTHERN AT POTTERS BAR

See Page 12

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Diesel-Hydraulic Debut

A NEW chapter in railway modernisation in Britain was opened by the Western Region on Monday of this week with a demonstration run, in which the Minister of Transport participated, by the first of the North British 2,000-h.p. A1A-A1A diesel-hydraulic locomotives, D600 *Active*. The Western Region is embarking on a scheme for complete elimination of steam traction west of Newton Abbot and diesel traction will also be substituted initially on many of the through trains between Paddington and Bristol and the West of England. This involves the replacement of over 200 steam engines by about 130 diesel-hydraulic main-line locomotives, 63 of which are being built by the North British Locomotive Company, of Glasgow, and 33 at the Swindon works of the Western Region. Of those being built by the North British Locomotive Company 58 will be of 1,000 h.p., and the remaining five of 2,000 h.p. The 33 to be built at Swindon works will be of 2,000 h.p. Orders have still to be placed for 34 2,000-h.p. locomotives for use in connection with the West Country dieselisation programme. On Monday the run simulated tightly scheduled semi-fast train duties, with a 35-min. booking for the 36 miles to Reading, for example. The maximum on the run between Paddington and Bristol was 93 m.p.h. The batch of locomotives D600-604 is being named after warships. Subsequent locomotives of this series will be named *Ark Royal, Bulldog, Conquest* and *Cossack*. The class was illustrated undergoing trials in our issue of January 4, 1958, and will be described subsequently.

Los Angeles Transit Authority

WITH the public sale on February 19 of bonds to the value of $40 million, the youngest of America's metropolitan transit authorities, that of Los Angeles, expects to put itself in a financial position to take over most of that city's transport services on March 3. During the past 30 years no fewer than 54 reports on Los Angeles transport have urged action; all have come to nothing because of the absence of an agency ready, able and willing to act. Even State legislation of 1951, which set up the Los Angeles Metropolitan Transit Authority, failed to create the powers necessary for the acquisition, financing and operation of transit systems, and it was only last year that the California Legislature reconstituted the authority as an agency of action and responsibility to carry out these tasks. The intervening years were, however, used to some purpose by the authority in planning the acquisition of existing transport facilities and their development by integration and co-ordination. Of the proceeds of the bond issue, $34 million will go to meet the costs of acquiring the two major undertakings, Los Angeles Transit Lines and Metropolitan Coach Lines, with its subsidiary Asbury Rapid Transit System.

Unpredictable Future

FROM the balance, the M.T.A. will finance immediate engineering studies to determine the next steps for integrated rapid transit in the authority's area. What form such rapid transit will take is impossible to forecast. It is to be expected that the city which has built the world's most elaborate system of overhead express highways (the "freeways"), solely to cater for the 66 private cars per 100 persons of the 420,000 who daily travel to and from the downtown area, will produce something dramatic. There have been several elaborate schemes for monorail systems suspended above the freeways over a distance of over 20 miles. For the passenger the only immediate evidence of change in ownership will be that, from March 3, his zonal transfer slips will be of a different colour. He may, however, look forward to the appearance in April of 110 new buses, originally ordered by Metro Coach Lines, in a new distinctive livery. In assuming this order, incidentally, the M.T.A. (as a public agency) will avoid paying Federal Sales Tax of some $210,000.

CURRENT TOPICS

Branch Line Investigation

THE report of the Central Transport Consultative Committee on the proposed withdrawal of train services on the Lewes—East Grinstead section of the Southern (H.M.S.O. Cmd. 360, price 2s.) illustrates vividly the care taken to see that public interests in transport are protected. This particular railway is one of those that probably should never have been built; it runs through sparsely populated country and has lost money over a long period. The bus and private car provide practically all the passenger facilities its territory needs. It has become known to fame as the "Bluebell line" in the popular Press. It has already been closed once, with the approval of the Transport Users Consultative Committee for the South Eastern Area; it was reopened after a flaw in the abandonment procedure was discovered. The Minister of Transport then ordered the public inquiry from which the present report is derived. The expenditure of a considerable sum of public money has resulted in a report from Lord Coleraine, as chairman, endorsing the closure and this is now to be carried out. This is one of those railways where a diesel service would merely mitigate the losses incurred, but the report is critical of the railway method of calculating the estimated losses, which include evaluation of line and equipment on a capital basis, to which interest is allocated, plus a notional sinking fund for its renewal. The lives allotted to equipment are also deemed unrealistic. The report contends, therefore, that the £59,000 loss claimed is too high and that it can only be asserted with confidence that the closing of the line will save £33,000 a year. The fact remains that the providers of public transport services—and the British Transport Commission seems particularly a victim in respect of its railway division—are not masters in their own houses. They are told they must pay their way on the one hand, but adoption of a commercial outlook is fraught with many obstacles.

Oil from Nigeria

ALTHOUGH the potential of Nigerian oilfields is still uncertain, the first substantial return on the vast amount of capital and labour expended on exploration and development was made this week by the shipment from Port Harcourt of the first export cargo of crude oil. The 18,000-d.w.t. tanker *Hemifusus* is routed for Rotterdam, where she will discharge her cargo at Shell's Pernis refinery. The oil was obtained from two oilfields which are being put on test production for several months by the Shell-B.P. Petroleum Development Co. of Nigeria, Limited, to determine their economic potentialities. One is at Oloibiri, in the swamp and mud of the Niger Delta, some 45 miles due west of Port Harcourt, and the other at Afam, in the bush country, 20 miles north-east of that city. In an intensive search for oil begun 21 years ago this month and extending over 40,000 square miles of Nigeria, some £27 million has already been spent and a sum in excess of £10 million is earmarked for this year. However, evidence of sufficient oil to ensure that the venture will be a profitable one for Nigeria and the company has not yet been found. Shell-B.P. has drilled 19 exploration wells and has discovered three oil-bearing regions, Oloibiri, Afam and Soku. The Soku find, situated in Rivers Province, 30 miles west of Port Harcourt, was announced at the end of January of this year. Although oil from the Afam field is already being pumped through a 6-in. pipeline to Port Harcourt at the rate of about 2,500 barrels a day, production from the Oloibiri oilfield is at the present limited to some 600 barrels a day until the 10-in. pipeline from Oloibiri to Port Harcourt is completed in March. Production from Oloibiri is then expected to increase to approximately 3,500 barrels a day which, together with the expected output from Afam, will bring total production to about 6,000 barrels daily.

Steel Fireboxes on the Southern

LAST week a most valuable factual paper on experiences on the Southern Region with steel fireboxes was presented to the Institution of Locomotive Engineers by Messrs. M. G. Burrows and A. L. Wallace. Mr. Burrows, who has had experience on four of the six regions, is chief mechanical and electrical engineer (designate) of the North Eastern Region and his co-author is a technical assistant at Brighton. The steel firebox is not common in Britain, where the preference for copper has always been a strong one, but the Southern Region has 140 Pacific locomotives with welded-steel fireboxes introduced by Mr. O. V. S. Bulleid with the Southern Railway Merchant Navy class in 1941. It was later adopted for the 110 West Country engines. The paper described the care in design and in fabrication necessary for success and in particular the value of X-ray inspection; it then outlined defects and the incidence of maintenance problems. It is of great interest that the original design for both classes of locomotive has required no modification, with the exception of the substitution of monel metal for some of the steel stays in the breaking zone and, in the case of the first 10 Merchant Navy boilers, the insertion of syphon diaphragm plates in the throat plate. The sound methods of training of welders and the high standard of control maintained over the welding is another factor in success. The former is, in particular, the basis of all successful welding applications and however sound may be the procedure which is laid down, it is useless to expect consistently good results unless the welders are masters of their technique. The care and attention which those in charge of construction and maintenance have given to their work has been a major contribution, as has the very close attention which the boiler inspectors have at all times given to the condition of these boilers and the fully controlled water treatment system. The highest mileage by a Merchant Navy firebox is 560,000, and by a West Country 546,000. Mileage between lifts is as much as 257,000 for the one class and 245,000 for the other.

Efficiency and Cost of Public Transport

IN a paper which he read last week before the Northern section of the Institute of Transport, Sir John Elliot, a past president of the Institute and chairman of the London Transport Executive, emulated the statue atop the Old Bailey in his equitable balancing of the scales. In discussing the right answer to the problem of efficiency versus cost in public transport he was, however, anything but blindfolded. When cost was taken into account it was obvious that the peak hours, with their inordinate demand for expensive equipment which was in use for only a very short time, were the biggest difficulty. It was not, moreover, only a matter of rolling stock, for crew costs were also disproportionately high. By operating standards this was all highly uneconomic and, therefore, inefficient and, if London Transport was simply out for a profit regardless of all else, it would have to cut some of the peak services to ribbons. Loads in the rush hours must, however, be carried, whether profitable or not, and the endeavour was to keep the factor of cost inefficiency as low as possible and balance it by the best use of crews and rolling stock in off-peak periods and at weekends. It was thus necessary to weigh the pursuit of efficiency against statutory obligations to the public.

Service the Best Aim

IT seemed likely that in 1957, thanks largely to extra traffic during the Suez fuel-rationing, the business as a whole had just earned its allotted revenue, despite the fact that the Underground and more than half the bus routes failed to earn sufficient to cover all costs, including finance charges. It was essential for any undertaking to cost out each of its services and try to put them on an economic basis, but that did not mean that it should withdraw all services which did not pay their way. These, if abandoned, might act to the detriment rather than the improvement of the finances. Where an undertaking had a monopoly it also became important for it to see that there was equality of treatment in all areas. One of the main difficulties facing passenger transport operators in recent years had been that travel at the height of the peak had maintained its level, whereas it had declined at nearly all other times. Consequently no major savings could be achieved without touching the peak hour service and it was for that reason that in the past London Transport had preferred to raise fares rather than cut mileage. If a public transport undertaking did not, could not, or was not allowed to pay its way, the question arose as to who was going to foot the bill. This brought in subsidies, but these in Sir John's view created more problems than they solved. It had moreover to be remembered that deficits could not always be avoided. This was particularly the case during periods of heavy capital expenditure; times when a longer term vision was necessary. The best that could probably be done was to aim at giving real public service.

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The Editor is prepared to consider contributions offered for publication in MODERN TRANSPORT, but intending contributors should first study the length and style of articles appearing in the paper and satisfy themselves that the topic with which they propose to deal is relevant to editorial requirements. In controversial subjects relating to all aspects of transport and traffic this newspaper offers a platform for independent comment and debate, its object being to encourage the provision of all forms of transport in the best interests of the community.

We desire to call the attention of our readers to the fact that Russell Court, 3-16 Woburn Place, London, W.C.1, is our sole London address, and that no connection exists between this newspaper and any other publications bearing somewhat similar titles.

South-East Suburban Saga

FROM time to time it is the practice of evening newspapers to investigate travel conditions around the metropolis; the *Evening News* has just conducted such an inquiry into the operations of the Eastern Section of the Southern Region and mainly into the services provided from Charing Cross and Cannon Street. One thing that must have struck the unbiased reader from the start was the fact that most of the reporters appeared to have had little previous experience of rush-hour travel (perhaps they all live in Fleet Street?) and they seemed to old campaigners on suburban trains to have been somewhat gullible in the stories they passed on—five fainting passengers in one compartment seems a little on the high side to us, for example. It is, however, clear that these intensely occupied routes of the Southern suburban system have had more than their fair share of bad luck in recent months—cable fires, point failures, electrical failures and incidents with freight trains have followed in quick succession, while at any time the tightly scheduled services are particularly susceptible to delays caused by weather conditions. That, however, does not affect our contention that the services are organised and operated with great skill.

Victim of its own Success

IN large measure the Southern suburban system is the victim of its own success. The electrification of the former South Eastern and Chatham suburban lines by the Southern Railway Company from 1926 onwards was well conceived and executed and immediately created fresh business. Estates grew with little overall planning—not that since planning assumed a larger importance in national affairs the planners have been distinguished for the way in which they have taken transport factors into account—and by 1939 the railway had nearly reached peak-hour capacity. This is governed by the five or six tracks between North Kent East Junction (on the London side of New Cross) and London Bridge on the widened formation of the original London and Greenwich Railway, the world's first suburban system; the four tracks thence to Cannon Street through Borough Market Junction; and the two-track connection from Borough Market to Metropolitan Junction on the Charing Cross line. Junctions throughout the suburban area are on the flat except at the Chislehurst—Bickley loops. As a result regular headway services have to be sacrificed at peak hours in favour of maximising capacity by use of parallel working through the junctions to reduce the number of conflicting movements. With the aid of four-aspect colour-light signalling, power-operated points and keen signalmen, exceptional train densities are handled with little delay, including 101 trains and light-engine movements through Borough Market Junction between 5 and 6 p.m., but there is little or no margin for contingencies and the junction working is especially sensitive to any out-of-course or delayed running.

Active Pursuit of Improvements

NEVERTHELESS, far from remaining indifferent or in any way justifying the "What a way to run a railway" type of comment which has been bandied about recently, the Southern Area Board and officers of the Southern Region have been extremely active in effecting further improvements. Despite the congestion of the timetable new paths have been contrived for additional trains; the Hayes line, for example, has had the 8.13 a.m. and 8.52 a.m. as extras in the up morning peak since the end of the war. The Bexley Heath and Dartford Loop routes have been relieved to some degree by 10 trains via the Nunhead Loop to Blackfriars or Holborn in the morning peak and corresponding down services at night, although these do not attract the heavy loadings taken by Charing Cross and Cannon Street services. The greatest expansion has been in the capacity of the trains themselves. At the close of the war in 1945 most of the peak-hour trains were made up of two three-car units with a two-coach trailer strengthening unit, the whole providing roundly 700 seats. These were re-formed for operating convenience as four-car units.

Notable Increase in Capacity

IN 1942 there appeared the first of 10 four-car units which made eight-car trains seating 936 persons, six a side in narrow compartments, but these were frankly uncomfortable and from 1946 onwards the practice of introducing semi-saloons, with two seats one side and three the other of the gangway, rather more generously spaced, was adopted. Compartment doors were retained and an eight-coach train carries 772 seated passengers—a 10 per cent lift over prewar practice. The 1,104-seat (including 88 of tip-up type) double-deck sets of 1949 would, it was hoped, have made a substantial contribution to removal of congestion, but unfortunately the channelling of twice the number of passengers through each side door at stations such as London Bridge with heavy traffic interchange slowed operations down so that they tended seriously to overstay station time. The alternative solution to the problem was the introduction from 1954 onwards of the 10-car trains, the scheme costing most of £6 million, largely in station and track alterations. The two-coach strengthening sets employed seat 186, giving roundly 960 seats per train. There is thus a gain of almost 37 per cent in capacity over 1945 on the trains which have been lengthened—no mean achievement. Unfortunately the change in public travel habits in the last few years has sharply steepened the peaks of travel and neutralised much of the benefits. At the same time the reward gained from suburban operation does not justify costly works such as tube extensions, widenings and flying junctions to ameliorate the position, especially as they would be fully used for under two hours out of the 24. The height of the peak now appears to be concentrated in the half-hour from 5.30 p.m. onwards; on one line the 5.49 p.m. is the only overcrowded train (and is quite unbearable), and the 6.4 p.m. and 6.19 p.m. go down with empty seats.

Staggered Hours Ultimate Solution

THE railway makes strenuous endeavours to deal with the situation. Every day the six platforms at Charing Cross handle 678 trains and the average daily number of passengers at this terminus is 129,015. From 7 to 10 a.m. 65 trains are received at Charing Cross and 62 at Cannon Street. In the evening period from 4 to 8 p.m. there are 83 trains from Charing Cross and 74 from Cannon Street. A census at London Bridge showed 8,522 passengers from the Dartford Loop in the period 8.15 to 9.15 a.m. and 7,332 from the Bexley Heath line; in the down direction from 5 to 6 p.m. 10,509 left for the Dartford Loop and 8,882 for the Bexley Heath route. In these busiest hours the overall increase in traffic is 58 per cent and it has, of course, outstripped the generous addition to train capacity made in the past 12 years. Happily replies to the *Evening News* criticisms were permitted both to Mr. Charles Hopkins, Southern Region general manager, who dealt forthrightly with the facts, and to General G. S. Szlumper, formerly general manager of the Southern Railway, who pointed the need of fundamental action in staggering of hours and dispersal of staffs away from London. Pending general acceptance of staggered hours as the ultimate solution of peak-hour problems, some further amelioration of the situation will derive from alterations at Holborn Viaduct which will enable all trains to be extended to the 10-car formation and the elimination of steam traction with the introduction of the Thanet and Dover electrifications. The Eastern Section of the Southern will remain a difficult railway to operate, but one on which observation over the years shows traffic and engineering skill is constantly lavished.

[Forthcoming Events appear on page 14]

MODERN TRANSPORT has an arrangement with Reuter's Trade Service whereby publication is made in this newspaper of all essential news from all parts of the world concerning traffic and transport by rail, road, sea and air and allied interests.

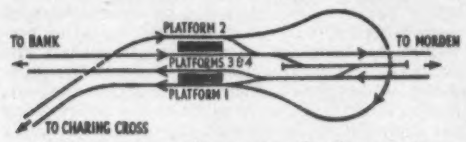
FULLY AUTOMATIC JUNCTION SIGNALLING

On London Transport Northern Line

TIME AND SEQUENCE PROGRAMME MACHINES

COMPLETELY automatic signalling of junctions without the employment of signalmen, but retaining full safety arrangements, was brought into operation by London Transport on the Northern Line on January 26. As already announced in our December 14, 1957, issue, programme machines which have been developed by London Transport, will carry out all signalling operations required to work the 900 trains a day on this line over their various routes and to their different destinations. The first machines are at Kennington and other installations will follow at Euston and Camden Town in the course of the year. They will then handle all Northern Line trains through the Kennington, Camden Town and Euston junctions. Signalmen will continue to control trains on the outer sections of the line.

London Transport has been making increasing use of automatic point operation at junctions, the controlling apparatus being actuated by information recorded in the first place by a signalman at a



Track layout at Kennington Station on the Northern Line

train dispatching point and stored in the train describers. Point operation of this type has been in use at Camden Town, on the Northern Line, since September 1, 1955. The first step in the development of the new system was the introduction of the remotely controlled power interlocking machine designed in the signal department of London Transport and first brought into use at Aldersgate, on the Circle Line, in 1955 (MODERN TRANSPORT, September 24, 1955). These machines are now also in use at locations on the Metropolitan Line and at Camden Town. They retain all the safety features and reliability of former mechanical interlocking systems, and their efficiency has made possible the development of the new programme machines.

Punched Holes in Plastics Bands

From the preliminary details already published, it will be recalled that the programme machines do not draw their information from train describers, but from a plastics roll of Melinex sheet in which are punched holes giving full particulars of every train for the complete working day as set out in the working timetables. The plastics bands, each some 8 ft. in length and 8 in. wide, are wound on rollers mounted in a frame which can be easily inserted into or removed from the machine. Separate rolls are provided for weekday, Saturday and Sunday working. One machine is required for each track.

On the plastics rolls are typed details, as they appear in the timetable and in proper sequence, of each train due to pass over the section of line concerned. The information includes the destination of the train, the train number, and its time. The holes, punched between the rolls of typing, are the coding of the information contained in the typescript. A contact assembly, consisting of 30 contact probes, is pressed against the programme roll by a compressed air cylinder, and only those contacts which are aligned with a punched hole will make at any given time. The contacts read in this way the particulars of the first train to approach the junction and signal it in accordance with the information punched into the roll, operating through the signalling circuits which set the required points and clear the signals.

Machine Operating Mechanism

The passage of the train energises a relay, which, in turn, energises the driving motor operating relay and removes the feed to the contact valve. With the air cut off, the contact assembly is lifted clear of the programme roll by a spring. A relay which detects that the contacts are lifted is then energised. With the motor operating relay and contact lifting relay energised, the electric motor which rotates the rolls, driving in normal or reverse direction through magnetic clutches, starts to operate, moving the roll onward. It is stopped by a photo-electric cell which energises a relay via a transistor amplifier circuit when a hole is located in the roll beneath it. It is not possible to drive the programme roll unless the contacts are lifted, and the roll can move only one step at a time in the normal direction, corresponding to one train movement. When the driving motor stops, air is readmitted to the cylinder, which puts the contact assembly back against the roll.

This sequence of operations continues throughout the working day until the last train movement steps the machine to the "normalising" position. Half an hour before traffic is due to recommence on the following day, a timing apparatus energises the normalising relay, which starts a sequence of operations causing the motor to drive the roll in the reverse direction until it reaches the starting position for the day's work. Two minutes before the first train is due, the timing apparatus energises a relay which causes the roll to be stepped to the proper position for the control of the train movement.

Supervision Room

The programme machine proper is located in the relay room, close to the junction being worked, and is part of the signalling equipment. A repeater of the programme machine—an exact duplicate—is located in the central supervision room, operating step by step with the local programme machine, and providing information to the member of the traffic staff in charge of the supervision room. In the Northern Line installation, the machines are in the supervision room at Leicester Square Station.

This is provided with an illuminated diagram of the area being worked by the programme machine, a set of push buttons for the manual control of routes, if necessary, and switches for switching the programme machine in and out. By the use of the switches in the central supervision room, the following conditions can be set up at Kennington:

(1) Normal programme machine working; everything will then run automatically, in accordance with the timetable.

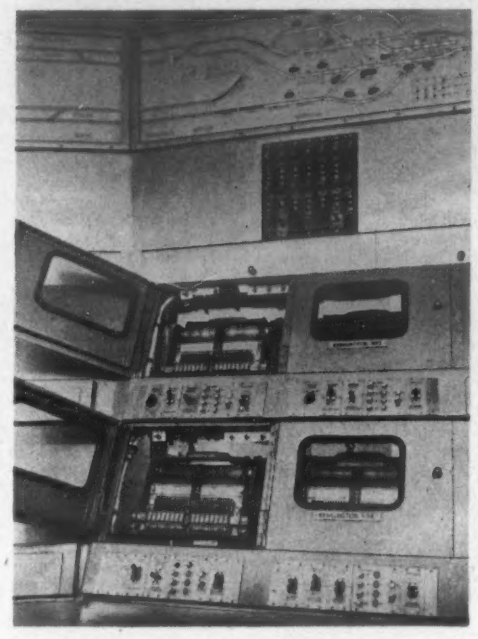
(2) In the event of a departure from the timetable, the equipment can be switched into train describer and "first come, first served" working, under which conditions the junction will continue to work automatically, but the trains will be signalled purely in accordance with their destination in the case of a splitting junction, and in accordance with the time of arrival in the case of a converging junction.

(3) All automatic working can be switched out and the routes manually operated from the push buttons in the central supervision room.

When a junction is operating under programme machine working and the trains are arriving in accordance with the schedule, the whole equipment will work entirely automatically.

Out-of-Order Running

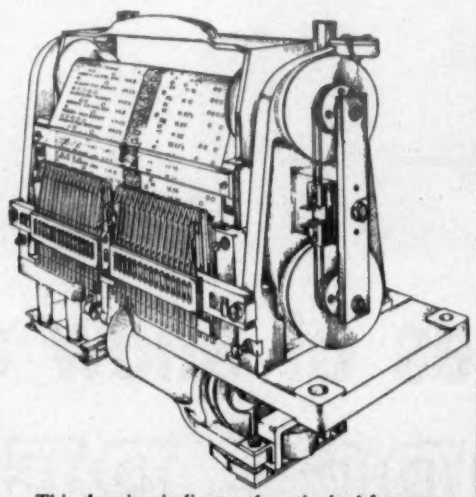
The programme machine is arranged to check the train description as received on the train describer with the train description as shown in the time-



The section of the control console now in use at Leicester Square supervision room, showing track diagram, push buttons for emergency manual signalling and programme machine repeaters, with associated switching equipment

table, and provided that they agree, the train is automatically signalled through. In the event of the train description appearing on the train describer differing from that shown in the timetable, the programme machine will delay setting the route for half a minute, and, during this time, a warning buzzer will be sounded in the supervision room at Leicester Square. If no action is then taken by the staff thereat, the programme machine, at the end of the half minute, will work in accordance with the train describer destination and will ignore the timetable arrangements.

In the event of the train description being in error, by pressing a button at Leicester Square the operator can cause the equipment to signal the train in accordance with the timetable and ignore the train describer. As long as the trains continue to appear on time, no warnings will be sounded at Leicester Square, but as soon as a train becomes



This drawing indicates the principal features of a time or sequence programme machine

more than two minutes behind the schedule time as shown on the programme machine, a warning will be sounded to draw the operator's attention.

At some converging junctions the programme machine will be arranged automatically to take account of a train on one branch being late, and if the lateness exceeds a predetermined amount, the machine will automatically send a train from the other branch forward, out of its turn. When this is done, the programme details of the train which was late will be stored, and that train is automatically subsequently signalled, so that the programme machine does not get out of step.

Train Cancelling Buttons

At the supervision room, provision is made for cancelling a train on the programme machine by means of one of four push buttons. When a message is received that, for example, train 98 has been cancelled, the operator in charge of the supervision room at Leicester Square will look for train 98 on the programme repeater. The cancelling button "1," "2," "3" or "4" is then pressed, according to the position in advance of that train on the programme roll. The button must be held until the lamp alongside it lights, to show that the cancelling operation has been duly stored. Once the button has been pressed and the lamp lighted, the equipment will count the trains as they pass with the

(Continued on page 9)

LORRY—BUS—COACH

Untaxed Vehicles are Existing Facilities

EVIDENCE brought at a public inquiry by British Road Services was sufficient to establish a statutory objection, the Transport Tribunal has ruled in the appeal by Bunny Hill Motors, Limited, against the rejection of its application for six tipping vehicles on A-licence. The Nottingham depot of B.R.S., it was stated, had de-taxed six vehicles in February, 1957, because of fuel rationing and later found it unnecessary to re-tax them. They were available for the work referred to by the applicant. This evidence was not shaken in cross-examination, says the Tribunal, and existing facilities were therefore both suitable and more than amply sufficient.

N.R.T.F. Treasury Deputation

NINE points were advanced by a deputation from the National Road Transport Federation to Mr. J. E. S. Simon, Financial Secretary to the Treasury, on February 12, proposing the abolition of purchase tax on commercial vehicles and a reduction of the tax on fuel for those vehicles and public service vehicles.

R.H.A. Clearing Houses Group

IT has been decided that, in order to foster a greater conformity in sub-contracting practice among hauliers, following the publication of the R.H.A. code of conduct for long-distance hauliers, qualifications for entry into the clearing house functional group of the Association should be relaxed. Hauliers sub-contracting a substantial volume of traffic may now join the group, provided they satisfy the other conditions of membership.

London Transport Timetables

THE latest editions of the local timetables published by London Transport include various useful changes. The book covering Kingston and Chertsey now includes more details of services in the Woking area and a plan of that town, while the Dorking and Leatherhead book has been expanded fully to cover Guildford and also has a town plan thereof. The Redhill, East Grinstead and Crawley book shows the extension of Southdown service 23 (Brighton—Crawley) to Northgate which took place on January 19 to replace London Transport 483. A new Southdown route—23A—combines with 23 to provide a half-hourly service between Pease Pottage and Northgate but operates via Southgate Drive.

B.R.S. Suggestions Scheme

ALL members of the staff of British Road Services are being invited to gain cash awards for traffic-getting or efficiency-promoting ideas. A cartoon-illustrated booklet handed to each member of the staff outlines the rules. The emphasis is on ideas to promote greater efficiency, to get new business and to effect economies. All suggestions will be considered by an adjudicating committee at B.R.S. headquarters and cash awards (not less than two guineas and substantially more for really worth-while entries) will be made for accepted ideas. An award may also be made for an idea if it is obvious that it has involved a great deal of work and thought. The awards are tax free.

Deduction from Compensation Payments

ATTEMPTS by insurance companies to deduct income tax when meeting claims for loss of use or loss of profit on motor vehicles involved in accidents are being resisted by the R.H.A. The insurers, it appears, base their action on the decision in *B.T.C. v. Gourley* in 1956, but the R.H.A. is relying on another ruling, that in *Herring and the B.T.C.* at Durham Assizes, also in 1956.

This was in respect of a claim for loss of profit from a damaged lorry and it was sought to deduct both income tax and surtax. Mr. Justice Donovan distinguished this case from Gourley. He found that income tax is not levied upon particular items in a business profits account. In this case they were dealing simply with the excess of earnings over expenses attributable to one vehicle in a mixed business. Gourley was awarded a lump sum to compensate for loss of profit in the carrying on of his profession. The R.H.A. has now selected three balancing charges cases to go before the Special Commissioners of Income Tax, in which it will seek to establish that the "open market" value of vehicles acquired by the B.T.C. was less than the prices received.

Loline for Middlesbrough?

INTERESTED in low-height double-deckers for many of its routes, including journeys over the Transporter Bridge, Middlesbrough Corporation has been told that Northern Counties Motor and Engineering Co., Limited, is building this type of body on a Dennis Loline chassis for exhibition at the Commercial Motor Show. It is reported that the builder is prepared to sell it after the show to the corporation and the offer is likely to be accepted by the municipal transport committee.

Independents Going

TWO East Midland area independent bus operators are involved in transfer of services. The 32-year-old Mansfield concern, Wass Brothers, Limited, the sole independent stage operator in that area, has concluded negotiations for the sale of the business to East Midland Motor Services, Limited—eighth postwar takeover for the latter.

East Midland independents in the news on this page: an A.E.C. Regent ex-Stockton Corporation and for some years operated by Victory of Ibstock; right, one of three ex-London Transport A.E.C.s operated by Wass Brothers, Limited, in its home town of Mansfield

Services comprise excursions and tours, colliery services and a daily stage service between Mansfield and Wellow via Clipstone and Ollerton which is coordinated with the Mansfield—New Ollerton services of East Midland and the Mansfield District Traction Company (as successor to Ebor Bus Co., Limited). Since purchasing three ex-London Transport A.E.C.s it has been possible to utilise these double-deckers for the full route; previously a low bridge between New Ollerton and Wellow necessitated lowbridge-type buses.

Windridge, Sons and Riley, Limited (fleet name, Victory), Ibstock, Leics, is the subject of an application in *Notices and Proceedings*. Brown's Blue Coaches, Limited, of Markfield and Ibstock. Brown's vehicles are already running "on hire" to Victory. Windridge, Sons and Riley has operated under two ownerships. The original operators of that name ran under the fleet name of Comfy until the shares were acquired by H. Bircher. Bircher originally ran under the name of Victory from Ibstock—running services between Heather and Leicester, Heather and Coalville, Coalville and Hinckley and colliery services. He sold out to B.M.M.O. in 1932 and concentrated on road haulage until nationalised. With his compensation he purchased Windridge, Sons and Riley and reverted to his old colours and fleet name. Within a few years he sold his Lount Colliery service to B.M.M.O. and in 1956 his Whitwick Colliery and Ibstock—Coalville services to Brown's Blue. The remaining licences are for excursions and tours, speedway, football and the Leicester—Measham service.

Licence Problems to be Discussed

LICENSING points which have been thrown up in recent months will receive consideration at a special meeting of the R.H.A. licensing committee on February 25. They include: the onus likely to rest on applicants seeking continuation of special A-licences (the first will expire at the end of this year or early in 1959); definition of "normal user" in relation to A-licence renewals generally; and the application of section 9(4) of the Transport Act, 1953 (statements made in support of licence applications). The Association is opposed to the principle that A-licence holders should be required to declare any substantial change in user during the currency of a licence and, if required by a licensing authority, to make a fresh application. On special A-licence renewals it thinks that an applicant should be required to do no more than to prove the normal user for the vehicles during the 12 months, or some such reasonable period, preceding the expiry date of the licence.

Export Chassis Exemptions

IN order to regularise the position arising where export chassis are sent by road from one works to another for the body to be added, or where outsize vehicles are taken on the roads for any kind of final test before proceeding to a port, the Minister of Transport is considering the insertion in the Motor Vehicles (Authorisation of Special Types) General Order, 1955 (S.I. 1955 No. 1038) of provisions to bring these movements within the exemptions from nearly all constructional requirements on complete vehicles proceeding for export. Notice would have to be given to the police along the route for the movement of vehicles exceeding 9 ft. 6 in. in width or over normal length.

Bus and Coach Developments

Orange Luxury Coaches, Limited, applies for a seasonal express service between London (Holloway) and Whitstable and Herne Bay.

Enterprise Bus Co., Limited, Otterhampton, Bridgwater, applies for the licences of K. B. Haybittel.

Alpha Coaches (Brighton), Limited, seeks the licences of H. K. Hart.

G. Keen and Sons, Heddington, Calne, seeks the excursions and tours from Swindon of A. Rimes and Sons, Limited.

Newport Corporation proposes a new service between High Street and Gainsborough Drive via Caerleon Road and St. Julian's Road.

Cooks Coaches, Southend, applies for excursions and tours previously operated by H. A. Smith.

R. Jarvis and Sons, Middle Barton, applies for a Friday service thence to Woodstock via Glympton and Horley.

Kingsway Coaches (Burn and Farrey), Langley Park, proposes a service between Burnhope and Durham via Peartree, Holmside, Edmondsley and Sacriston.

N. Smith, Grantown-on-Spey, applies for the Kingussie Station—Fort William service and the excursions and tours from Kingussie operated by Dean Brothers.

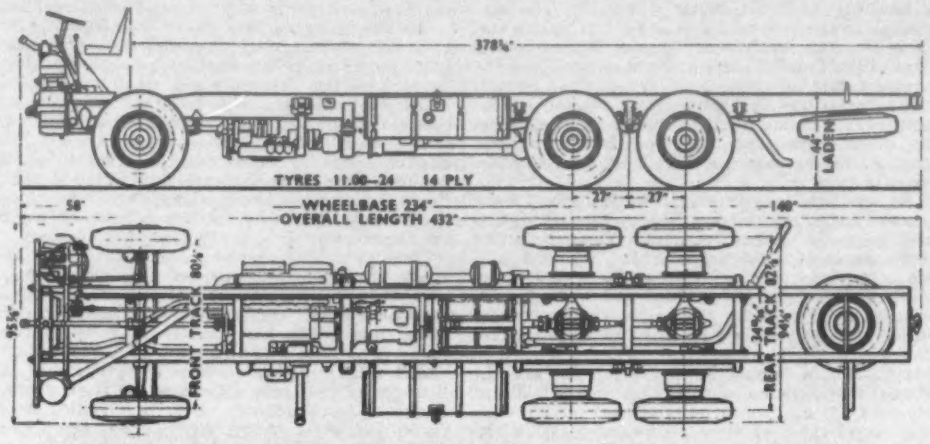
A new circular route was introduced by Edinburgh Transport Department on February 16. This is formed by linking up routes 42 and 43, extending 42 from its present terminus at Surgeons' Hall via the Mound to St. Andrew Square. The circle route will be numbered 42; 38 has been withdrawn and the frequency of 39 increased.

SCOTSTOUN GIANT

Albion Six-Wheeled Bus for South Africa

RECORDED briefly in our issue for February 15 were details of the shipment of the first batch of a total of 20 new-type buses built by Albion Motors, Limited, for the South African Railways and Harbours Administration. The new vehicle, named Royal Scot, is designed to a specification likely to meet a demand overseas for a high-speed vehicle capable of withstanding tough conditions and operating long-distance services over unmetalled roads. The 20 for South Africa are to be fitted with 61-seat single-deck bodies and weight of 21¼ tons. The chassis has a wheelbase of 19 ft. 6 in. and an overall length of 36 ft. The 8 ft. 2½ in. wide bodies to be built by Bus Bodies, Limited, Port Elizabeth, will seat 61 passengers, eight in a first-class saloon at the front and 53 on five-abreast seats in the main compartment. Each compartment will have a separate entrance.

Power is provided by the Leyland-Albion O900 horizontal six-cylinder diesel engine, which has a normal rating of 230 b.h.p. at 1,900 r.p.m. and



Principal dimension (all in inches) of the Royal Scot are shown in these drawings

used on S.A.R. and H. country road passenger services, where they will operate over secondary roads classed as moderate to severe.

The Royal Scot is a six-wheeled underfloor-

The Albion Royal Scot single-deck chassis

engined chassis with twin rear driving axles and single tyres 11.00-24 on all wheels. It is designed to operate with a four-wheeled luggage trailer with a gross weight of 5¼ tons at a gross combined torque of 700 lb./ft. at 1,200 r.p.m. but in this application is derated to 200 b.h.p. at 1,800 r.p.m. The chassis is unusual in an underfloor-engined layout for having the radiator mounted in the conventional position at the front. This is done to provide good ground clearance and to keep the radiator clear of possible damage from dust, stones and watersplashes and also to provide a better flow of cooling air.

Overdrive Gearbox

Major units include a six-speed constant-mesh gearbox with overdrive top, mounted in unit with the engine at three points in rubber, and a rear bogie comprising two 8-in. centre overhead worm-drive axles mounted on four-spring balance-beam suspension. A third differential is not fitted as maximum traction is required over soft ground. A dual-circuit layout is used for air-pressure brakes, which have leading-trailing-shoe drum equipment at all six wheels. The double air valve supplies air for front and rear axle brakes and separately for intermediate axle and trailer brakes. A hand-control valve mounted on the steering column provides for independent operation of the trailer brakes.

To relieve the main brakes on long gradients, there is also an engine exhaust brake. The exhaust-brake operating mechanism is interlinked with the hydraulic clutch operating mechanism so that if the clutch is disengaged while the exhaust brake is applied, the exhaust brake is automatically released. The cam and double roller steering is equipped with power assistance.

The manufacturer reports that independent road tests of the Royal Scot have shown that the vehicle has a consumption as low as 11.4 m.p.g. when driven fully laden at an average speed of 28 m.p.h. Based on a time-load-mileage factor, the Royal Scot is said to be most economical at speeds between 40 and 50 m.p.h., which is the speed at which it is most likely to be driven in South Africa.

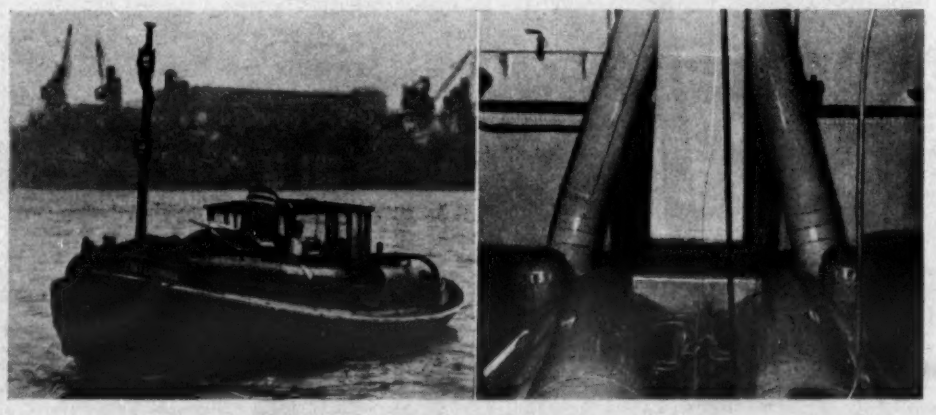
Waterways Tug Re-engined

"ENTERPRISE" FITTED WITH AIR-COOLED DIESEL

SATISFACTORY performance of Petter-McLaren air-cooled diesel engines in marine craft has led to British Transport Waterways specifying this type of power unit for the tug *Enterprise*, which has just completed trials on the Thames following rehabilitation to fit the craft for a new role. The new engine is the Petter-McLaren PDV8M, an eight-cylinder V-form engine developing 96 b.h.p. at 1,800 r.p.m., and forms the largest air-cooled marine diesel engine installation yet in this country.

The PDV8M is the first of its type to be built; by a 44-s.h.p. PD4M, while a diesel-hydraulic dredger built by John Allen (Oxford), Limited, now being fitted into a narrow boat by British Waterways, is powered by a 24-b.h.p. PD3M air-cooled diesel.

Previously in the service of the South Western division of British Transport Waterways, where it was used in towing steel barges between Gloucester and Stourport on the Severn, *Enterprise* was built in 1930. She has a gross tonnage of 20.83 with a length of 41 ft. 6 in. and a beam of 11 ft. The draught is 6 ft. aft and 4 ft. forward. The Petter-



British Waterways tug "Enterprise," re-engined for service at Regent's Canal Dock, undergoing trials on the Thames and, right, a view of the new Petter-McLaren air-cooled V8 diesel engine installation showing incoming and outgoing air trunking

it forms one of a range produced by J. and H. McLaren, Limited, Leeds (a Brush company in the Hawker-Siddeley Group), and it is the fourth Petter-McLaren air-cooled diesel engine to be fitted into British Waterways craft. The narrow boat *Bexhill*, operated by the South Eastern division, has been powered by an 18.5 s.h.p. PD2M since June, 1956. Influenced by its satisfactory performance, a further four similar units have been ordered. The tug *Falconbrook*, used in towing dredger hopper boats on the River Lee, is powered McLaren engine has a bore of 4.5 in. and a stroke of 4.33 in. Maximum b.h.p. of 96 at 1,800 r.p.m. provides a shaft horsepower of 87 through a Self-Changing Gears oil-operated 3 to 1 reduction-reverse gearbox. Fuel consumption is 0.413 lb. per b.h.p.-hr. at 1,500 r.p.m. and 0.419 lb. per b.h.p.-hr. at 1,800 r.p.m. Electric starting is provided with a 24-volt 120-amp.-hr. battery. With a three-bladed 36-in. diameter 19-in. pitch propeller, the tug has a speed of 7.8 knots at

(*Continued on page* 16)

MOTORWAY APPROACHES TO LONDON

Work to Start on St. Albans By-pass

THE Minister of Transport and Civil Aviation recently authorised his agents, the Hertfordshire County Council, to accept a tender for the construction of the first section, 12 miles long, of the St. Albans By-pass at a cost of about £4¼ million. This section extends from the North Orbital Road near Park Street to the Hertfordshire-Bedfordshire county boundary and includes also a link with A6 just south of Luton. The successful tenderer was Tarmac Civil Engineering, Limited. The St. Albans By-pass is an essential part of the London—Yorkshire Motorway and the contract date for completion, October 31, 1959, is the same as for the Birmingham section of the motorway. Unlike the Birmingham section, where the whole of the carriageways will have an asphalt surface, the by-pass will have reinforced concrete carriageways.

As was indicated in a map in MODERN TRANSPORT of December 10, 1955, the by-pass will divide at a point due west of St. Albans. The first section will connect with the North Orbital Road (A405), while the other will go on to the Watford By-pass west of Aldenham. From these points traffic will proceed to London by alternative routes, both of which will ultimately have dual carriageways all the way to the Finchley Road. One route will be via the North Orbital Road (A405), A6 and the Barnet By-pass; the other will be via the Watford By-pass. Altogether 21 miles of dual carriageways will be provided on these routes between the two arms of the motorway and the Finchley Road. The estimated cost of these improvements to existing roads, some of which have already been started, is about £5 million.

St. Albans By-pass

The St. Albans By-pass connects with the Birmingham section of the motorway at Pepperstock, near Luton. From this point a connection is provided with A6 south of Luton so that the by-pass may be used by drivers wishing only to avoid going through St. Albans itself. The by-pass will be in the shape of an inverted Y. On the stem there will be dual 36-ft. carriageways, while the two arms will have 24-ft. carriageways. To ensure an uninterrupted traffic flow, fly-over junctions will be provided at the junction of the Luton link and at Beech Tree where the road divides. A two-level junction will also be formed at the point where the new road will be joined by a spur to the newly industrialised parts of Hemel Hempstead. There will also be connecting links where the new road passes the A5, west of Harpenden.

The line of the by-pass was fixed in March, 1957, by a scheme under the Special Roads Act, 1949. In October, 1957, the Minister advertised a draft Order showing proposals for treatment of side roads, footpaths and accesses affected by the by-pass and hopes very soon to make this Order with some amendments to meet objections to the original proposals. Contract No. 2 for a further five miles of road from Beech Tree to the Watford By-pass near Aldenham making a total length for the by-pass of 17 miles, will be advertised within the next two or three months.

Construction of the by-pass, besides providing a new route for traffic to and from Birmingham, should also ease the now congested and dangerous conditions in the villages of Elstree, Radlett, Park Street, and Redbourn, as well as in St. Albans itself. The design of this part of the motorway, including 26 bridges, has been carried out for the Minister by the agent authority, the Hertfordshire County Council (county surveyor, Lieut.-Colonel C. N. ffolliott). Another 13 bridges have been designed by Sir Owen Williams and Partners, consultant for the London—Yorkshire Motorway.

Alternative Route Improvements

From a roundabout at the eastern terminal of the St. Albans By-pass, dual carriageways are to be provided on the North Orbital Road to the point where it enters the London Colney By-pass, on which work is now in progress. From the south end of this by-pass dual carriageways will be provided on the existing A6 and a by-pass for South Mimms is being built. Southward from this last by-pass and alongside the existing Barnet By-pass a second carriageway will be built. Similarly the roads to London from the roundabout junction of the St. Albans By-pass and Watford By-pass west of Aldenham will be improved either by widening and duplicating the existing road or where possible the provision of new sections of road built to dual carriageway standards.

South of Apex Corner, where the alternative routes meet, two carriageways already exist as far as Page Street and work has recently started on extending this improvement southward along A41 in Hendon to the Finchley Road. Laybys will be built at each bus stop on the Hendon Way section and there will also be a subway for pedestrians. A flyover junction is to be built at Brent Cross to carry trunk road traffic over the North Circular Road. The latter, which acts as a distributing artery for traffic between London and the North, is being improved, particularly a section four miles long from Bowes Road to Great North Way, which will have twin three-lane carriageways in place of the existing 30-ft. carriageway.

Some of these schemes are already being prepared, and the Minister has asked the county councils of Middlesex and Hertfordshire whether they could undertake the preparatory work for the remainder of the schemes within specified periods. The starting of constructional work on the schemes will be phased in accordance with the limits on expenditure agreed by the Government.

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MODERN AIRWAYS and COMMERCIAL AVIATION SECTION

AIR TRANSPORT IN EAST AFRICA

*Steady Growth of E.A.A.C. (Cont.)**

WIDE VARIETY OF FACILITIES

THE advent of the three Argonaut aircraft from the British Overseas Airways Corporation has modified the pattern of operation of East African Airways, which, incidentally, knows the machines as Canadairs, as was foreshadowed in the previous article. It was also pointed out that the temporary use of Eastleigh Airport, while necessary for the large aircraft, was in itself the source of further complications. The opening on March 8 of Embakasi should, however, mark the beginning of the consolidation which is so desirable if the E.A.A.C. is to be able to expand as it wishes while retaining its present level of efficiency.

At the present time the large aircraft are used on a weekly service between Dar-es-Salaam and London via Nairobi, Entebbe, Khartoum, Benghazi and Rome, which forms part of the co-ordinated facilities provided by B.O.A.C., Central African Airways, E.A.A.C. and South African Airways, on a weekly service from Nairobi to Bombay via Aden and Karachi, on a weekly service from Nairobi to Durban via Dar-es-Salaam and Salisbury (Southern Rhodesia), on a Monday flight from Nairobi to Entebbe and back and on a Tuesday flight from Nairobi to Dar-es-Salaam via Zanzibar with the return flight on Fridays. These last two flights are really positioning flights for the aircraft on the London run.

One of the nine Douglas DC3s of the East African Airways Corporation

Regional Services

The scope for using the four-engined aircraft in other directions is somewhat limited. The airport at Mombasa, the important seaport of Kenya, is not usable and the rest of the points served are not really in need of so large an aircraft. Some of the airfields are, in fact, in receipt of services operated by four de Havilland Dragon Rapides, which East African Airways still has in service. Ingenious timetabling makes it possible to cover requirements with two aircraft. One, based on Dar-es-Salaam, is needed for operations to and from Pemba Island and flies between Dar-es-Salaam, Zanzibar, Pemba and Tanga. The other, based on Nairobi, flies on Mondays to Mwanza via Macalder and Musoma, returning on Tuesday morning. Thereafter it is available to operate on afternoon service to Entebbe via Eldoret, Kitale and Tororo and on the Wednesday morning to undertake in a clockwise direction the circular service from Entebbe via Murchison Falls, Arua, Gulu, Lira and Soroti. There is a morning flight on Thursdays back to Nairobi via Tororo and the rest with an outward flight the following day and another flight on the circular route, this time in a clockwise direction, on Saturday. The aircraft returns to Nairobi on the Sunday morning.

By and large E.A.A.C. relies on its fleet of nine DC3s to keep up its basic services. This type, indeed, still makes some forays beyond the boundaries of the territories. To deal with these first. There is a weekly flight from Nairobi to Aden via Hargeisa, a route which is served also by Aden Airways. Then there is a tourist-class flight by the coast from Nairobi to Durban via Dar-es-Salaam, Mtwara, Mozambique, Beira, where there is a night stop in each direction and Lourenço Marques. This operates weekly as does a colonial coach-class service from Nairobi to Salisbury via Mombasa, Tanga, Zanzibar, Dar-es-Salaam and Blantyre. The remaining extra-territorial service is that from Dar-es-Salaam to Abercorn and Ndola in Northern Rhodesia. This is also operated weekly via Sao Hill and Mbeya.

Reference has already been made to the operations of the Rapides within the three territories of Kenya, Tanganyika and Uganda and also to local facilities provided by Canadair-operated flights. The DC3s shuttle backwards and forwards within the territories and with, as was emphasised in the previous article, a considerable variety of interior layouts according to the route on which they are operating at the moment. There are at least two flights a day between Nairobi, Mombasa, Tanga, Zanzibar and Dar-es-Salaam and the timings enable business men from the capital to travel down to the coast and back within the day. At one time comparable behaviour was possible in the opposite direction but the evening departure from Nairobi has been withdrawn. So far as Mombasa is concerned the there-and-back-in-the-day facility represents competition with the night mail train service composed of modern rolling stock including sleeping cars, but we noticed that both air and rail services were loading well.

Certain of the coastal services call intermediately at Arusha and Moshi between Nairobi and Dar-es-Salaam and at Mombo between Mombasa and Tanga. What may be termed the other main service is north-westward from Nairobi to Entebbe, the modern Uganda airport which also serves Kampala. Most of the DC3 flights call intermediately at Kisumu and Jinja, although one operates instead via Mwanza. Four flights a week continue beyond Entebbe to Kasese and Kasenyi, the former call serving the Kilembe mines.

Most of the other services are maintained on a weekly or twice-weekly basis, although overlapping often results in a greater frequency than that over certain sectors. Entebbe is linked with Dar-es-Salaam via Mwanza, Tabora and Iringa, a route which is served also from Mwanza onward by a weekly Nairobi—Dar-es-Salaam service, save that the latter flies farther south and west via Mpanda and Mbeya between Tabora and Iringa. The Tanganyika internal service based on Dar-es-Salaam is flown on five days a week on a variety of routes. Thus the Monday morning departure is by way of Mafia, Kilwa and Nachingwea to Mtwara and thence back via Lindi. The Tuesday departure is via Mbeya, Njombe, Songea, Sao Hill and Iringa, back to Dar-es-Salaam.

Special Facilities

East African Airways has been one of the most energetic airlines as regards special fares promotion. It introduced, for example, a whole series of business excursion fares available mostly for two or three days and these at midweek. Another facility introduced was a series of holiday excursion fares. The minimum was usually 12 days and the maximum 30 days, although these provisions varied. All inclusive holidays are arranged with hotels at Malindi and Mombasa from all points in East Africa, from many in Central Africa and from Durban. These fares cover the cost of the air passage, transport to and from the hotel and accomodation. These special fares apply also to Lushoto, Mafia and Kitale. Special all-inclusive tours are also in operation for the Queen Elizabeth Park and the Murchison Falls Park in Uganda from Entebbe and Nairobi.

The role of East African Airways on territories that are continuing to develop is obviously one of great responsibility. It provides regular and rapid communications with remote areas which are often unserved by rail and frequently have indifferent roads at best. It represents the main delivery service for residents in these districts and many have come to accept as a matter of course the arrival of groceries, tinned meat and other supplies. Conversely the farming areas of country send their produce to Nairobi or down to the coast. Apart from domestic aspects of these services there are also the more commercial matters such as spare parts, machinery, typewriters and many other imports. As development continues the demands of business travellers grows and the E.A.A.C. traffic is likely to follow suit.

Dawn at Salisbury sees a DC3 of E.A.A.C. waiting to operate the Federaliner colonial coach service to Nairobi

* The previous article appeared July 13, 1957.

NEWS FROM ALL QUARTERS

London Midland Region Suggestions Scheme

The cash award scheme for securing more goods and passenger traffic to rail, introduced by the London Midland Region, has brought over 50 suggestions from the staff. As much as £5 can be won from this spare-time occupation.

Compensation for S.L. and N.C.R. Staff

Following the closing on September 30 last of the Sligo, Leitrim and Northern Counties Railway redundant staff has been paid compensation at the rate of one month's pay for each completed year of service up to a maximum of 24 months. About £35,000 has been paid in sums ranging from £1,000 to £100.

Geneva—Milan Diesel Service

From June next onwards a Trans Europe Express (T.E.E.) connection between Geneva and Milan will cover the distance of more than 200 miles, in about four hours, stopping only three times, at Lausanne, Brig and the Italian frontier town of Domodossola. Customs formalities will take place in the trains.

Blackwell Tunnel Urgency

London County Council has recently urged the Minister of Transport to give an early authorisation to the scheme for duplication of Blackwall Tunnel because of the relief of traffic congestion which it would afford. The L.C.C. has intimated that it would then be prepared to defer its controversial plans for demolishing the present Albert Bridge in Chelsea and erection of a modern bridge in its place.

Rail Rover Ticket for Scotland

A new comprehensive season ticket, named "Freedom of Scotland," is to be introduced from the beginning of April by the Scottish Region of British Railways. It will provide unlimited travel facilities for seven consecutive days anywhere on British Railways in Scotland and on the Clyde Coast and Loch Lomond steamer services of the Caledonian Steam Packet Co., Limited. The cost is £9 first-class or £6 second-class and half rate for children (three years of age and under 14) for individual tickets, but for families there is a special concession.

Ghana Railways Diesels

The first of the Birmingham Railway Carriage and Wagon general purpose Bo-Bo locomotives, powered by Paxman 12-cylinder 410-b.h.p. engines, was put into operation by the Ghana Railways and Harbours Administration, in June last year. By the end of the year, reports Davey, Paxman and Co., Limited, all 13 locomotives were being used regularly on shunting, in inland and port areas, local and main-line passenger trains, operating between Takoradi, Kumasi and Accra, including the "Blue Train." During the six months under record, the first locomotive had completed 1,025 hours (23,000 miles). Eight others passed the first 500-hour inspection, the only parts renewed being replacement joints.

Longest Aerial Cableway

The longest aerial cableway in the whole of Europe, about three miles long and with 163 two-seater gondolas, is now completed to haul tourists to the Rinderberg (3,500 ft.) above Zweisimmen in Switzerland.

Oxford Eastern By-Pass

A contract has been placed by Oxford City Council for construction of the second section of the Oxford Eastern By-Pass. Work on the first and shorter section, from the Henley Road to Garsington Road, started in April last year and is being carried out by Oxfordshire County Council, using direct labour. Work on the second section, from Garsington Road to London Road, is expected to start in March and will be completed by the end of this year.

Rhodesia Railways Revenue

Gross revenue of Rhodesia Railways rose by over £3,700,000 to the record figure of £27,900,000 for the financial year ended March, 1957. Capital expenditure of £4,382,000 represented a shortfall of some £4,500,000 against the total of £8,900,000 for which provision was made from Federal Government loan funds. This shortfall was due to the lack of sufficient technical staff to carry out the planning and supervision of works. Working expenditure, including provision for depreciation and renewals, amounted to £23,175,000, an increase of £2,900,000 over the previous year.

New Ticket Offices for Euston

Euston Station is to have new ticket offices with more booking windows and equipped with ticket printing and issuing machines. Reconstruction of the ticket offices means the removal of the railway police to new offices at the side of the Doric arch and conversion of the present police office (in the station forecourt) into a post office. The post office will then be moved from its present premises at the west side of the booking hall to leave the way clear for reconstruction as mechanised ticket offices. When this accommodation is completed and in use, the existing ticket offices on the east side of the booking hall will also be modernised.

Coventry Shopping Precincts

Modern features in the road planning of the rebuilt Coventry have been described by Mr. Granville Berry, city engineer and surveyor. The most significant and far-reaching feature of the new city centre, he says, has been the construction by the City Council of traffic-free shopping streets where the premises are serviced by rear-access roads and the usual carriageway is replaced by paved areas laid out with ornamental features. In these areas, arcaded footpaths and pedestrian subways have been provided to allow shopping to be done under safe and pleasant conditions. Plans are being prepared for the erection of multi-storey car parks at the rear of the traffic-free streets, and work is also proceeding on the construction of a roof-top car park for 250 cars as part of the new central retail market. The approach ramps will have thermostatically and hygromatically controlled heating elements to counter frost and ice.

COMMERCIAL AVIATION

B.E.A. and Its New Jet

SECOND ELECTRA FLIES

IN a written reply in the House of Commons last week the Minister of Transport and Civil Aviation, Mr. Harold Watkinson, said that British European Airways was opening negotiations with the new company in which de Havilland, Hunting Aircraft and Fairey were participating regarding its requirement for a new jet air liner. Rolls-Royce would develop and manufacture the engines. The Government would wish to be satisfied that the whole project would be developed and manufactured as a private venture by the companies concerned.

Aerlinte to Start on April 28

The new Aerlinte Eireann transatlantic service linking Dublin and New York will come into operation on April 28. Following the inaugural flight, three round trips will be made each week until May 31 and a daily service will be operated from June 1 to October.

Busy New Zealand Air Services

Last year scheduled air services within New Zealand flew 122 million passenger-miles. Total population of the country is only 2¼ million. The average passenger load factor was 75 per cent. Overseas passenger business rose by almost 24 per cent. Wellington was again the busiest air centre with 35,907 aircraft movements.

New Jordan Airport

Negotiations for the construction of a new airport at Jericho, situated 1,300 ft. below sea level, with a 1-mile runway, have been completed between the Jordan Ministry for the Economy and United States interests, it has been announced in Amman. Costing about £1 million the airport will serve the Jordan-held sector of Jerusalem, the existing airfield for which is adequate only for DC3-class aircraft and very difficult to extend.

Second Electra Flight

The second prototype of the Lockheed Electra, the first American turboprop air liner, flew for the first time on February 13—46 days in advance of the original target date, March 31. The maiden flight lasted 1 hr. 53 min. Two other Electras will join the first pair in a programme to obtain Civil Aeronautics Administration certification by or on September 30. The third aircraft, which will be the first one fitted with a normal interior instead of flight test instruments, is due to fly on April 17.

Swissair Increases Middle East Services

Nonstop Zurich—Tel Aviv flights connecting with the afternoon DC6B Super Swiss service from London, are one of the innovations of the Swissair summer schedules for its Middle East services, which take effect on April 1. They increase to thrice-weekly the frequency of Swissair services to Israel. A second weekly service will also be introduced to Damascus, leaving Zurich on Friday and calling at Athens and Beirut.

New Services Approved

The Minister of Transport and Civil Aviation, after considering the recommendations of the Air Transport Advisory Council, has approved:

A normal scheduled service on the route London Airport or Blackbushe Airport—La Baule (Montoir)—Saragossa; Eagle Airways, Limited, until November 30, 1963 (seasonal April to November inclusive each year).

A normal scheduled service on the route London—Nice (optional stop)—Naples; British European Airways until October 24, 1964.

Inclusive tour service between London (Blackbushe) and Las Palmas with an outbound night stop at Lisbon; Eagle Aviation, Limited, until April 30, 1958.

Helicopter service between London Airport, Gatwick and Southend; British European Airways until December, 1964.

Internal service between London Airport, Gatwick and Southend; British European Airways until December, 1964.

Normal scheduled service on the route London—Lisbon—Las Palmas—Dakar—Bathurst—Freetown—Accra; Hunting-Clan Air Transport, Limited, until December 31, 1967.

Normal scheduled service on the route London—Lisbon—Las Palmas—Dakar—Bathurst—Freetown—Accra; Airwork, Limited, until December 31, 1967.

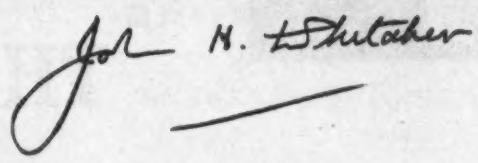
P.A.A. Testing New Device

A device enabling a pilot to establish communications immediately with a specific station by pushing a button is being tested by Pan American World Airways, in co-operation with the New Zealand Government, on the route between the Fiji Islands and Auckland. Known as the Auto Alert, it eliminates the need for the pilot to use the radio-telephone to establish communications with a ground station. The push button accomplishes that and leaves the pilot free for other navigational duties. When the button is pushed, automatic switching causes the aircraft's radio to send out distinctive tone and identification signals on two frequencies constantly monitored by ground stations. The signals continue until the pilot speaks into his radio-telephone. The device was developed from Selcal (selective calling of aircraft) and Calsel (calling to a selected ground station), which placed the equivalent of a home telephone in the pilot's cockpit. These two systems enable a ground station to call the particular aircraft it wants and, conversely, the pilot to call the specific ground station he wishes to contact.

How Profits Could Come

Airlines would show profits instead of losses if they stopped the craze for speed and concentrated on safety and comfort, said Wing Commander L. P. Elwin, joint managing director of Cambrian Airways, when he addressed a luncheon meeting of the Industrial Association of Wales and Monmouthshire at St. Mellons this week. There appeared to be two main reasons for the unhappy picture of losses. Technical advancement was so rapid that new equipment became obsolete within a matter of a few years. National prestige in the field of aviation was considered so important that every Government was prepared to subsidise its carriers in some form or other in order to save face. The cure for this unsatisfactory position was in his opinion quite simple. Stop the craze for speed as far as civil transport was concerned; hold a moratorium on speed and style for a period of 10 years; concentrate on safety and comfort. Give the new aircraft a life of 20 years instead of eight or 10 and the whole economics of aviation would alter to the benefit of all concerned. A breathing spell was badly needed—and would be welcomed—if the world was to have what we all wanted—cheap air travel. The independent operators had been and still were working against great odds. Many of them now formed a valid portion of the air routes serving the United Kingdom and the public as a whole would be considerably worse off without them. "I am convinced that the independent operator can continue to serve a useful purpose. There is no real need for them to be competitive with the national operators. On the contrary, with goodwill on all sides they can be complementary, to the benefit ultimately of all concerned—the public, the Government and the independents."

M.P.T.A. PRESIDENT



Alderman JOHN H. WHITAKER

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Chairman of the motor buses committee of Todmorden Town Council for nearly 35 of the 50 years which have elapsed since that corporation first began motor bus services in 1907, Alderman John Henry Whitaker, the 72-year-old but ever-young president of the Municipal Passenger Transport Association, started work half time at the age of 11 in the textile industry as a reacher-in. Two years later he commenced skilled work as a twister, but continued his education by attending evening classes on subjects ranging from first aid work through cotton weaving and designing to bookkeeping and shorthand. Joining the mechanical transport section of the (Royal) Army Service Corps in April, 1915, he was one of those drivers trained by the London General Omnibus Co., Limited, and thereafter saw service in France and Belgium before demobilisation in 1919. Elected in that year to the Todmorden branch committee of the Amalgamated Association of Beamers, Twisters, Drawers and Machine Workers, he became branch president 18 months later and continued in that office until March, 1948. His service on the national executive council of the association as branch representative was not much shorter as it ran from January 1, 1921, to December 31, 1946. Alderman Whitaker was also chairman of the local textile federation and president of the Todmorden Trades and Labour Council for a number of years. For 30 years—from 1920 to 1950—he was closely concerned with the work of the Joint Industrial Council for Local Authorities Non-Trading Services (Manual Workers) as a representative of the employers and held a number of offices on the provincial council for the West Riding as well as serving for a period on the National Joint Council for Local Authorities Services (Manual Workers). He was elected to Todmorden Town Council in November, 1920, and has served thereon ever since, being elected an alderman in 1937 and mayor for 1931-32. He was made chairman of the motor buses committee after only a year on the council and he was thus occupying that office when, under a provisional Order of 1923, the undertaking began to operate beyond the borough boundaries to Burnley, Bacup, and Hebden Bridge and subsequently to Keighley and Rochdale. Since the setting up of the Todmorden Joint Omnibus Committee in conjunction with the London Midland and Scottish Railway in January 1, 1931, he has held office as chairman and deputy chairman in alternate years. Famous as a contributor of sound commonsense to discussions at Public Transport Association and other meetings and a well-known figure for many years at the annual conferences of the Municipal Passenger Transport Association, his election as vice-president for 1956-57 was warmly welcomed as anticipating his present office. He has, since 1949, been a member of the North-Eastern Gas Consultative Council, chairman of the Huddersfield-Halifax local committee since its formation in 1950, and, from the same year, chairman of the Halifax District Advisory Committee for National Insurance. In 1930 he was appointed a magistrate for the West Riding.

IN PARLIAMENT

Long-Term Road Planning

LONDON IMPROVEMENTS

LAND acquisition for new road construction was taking too long and, since the road programme would be expanding, there was a case for consultations with local authorities to draw up the required programme, said LORD DERWENT in the House of Lords in a debate on February 13. He wanted the Minister to be able to spend money on construction as soon as he received it. As things were the preliminaries to actual construction not only took too long, but took place at the wrong time. If the Government announced that the scale of the present programme was to be doubled it would still be 1961-62 before there was any noticeable construction, but by 1961, provided the preparatory work was done now, the Minister could start 700 miles of new roads by holding back 1 per cent of the money in the current programme. Either the local authorities should act as agents for the acquisition of land and carrying out preparatory works, or advisory committees should be set up to carry on the work of the Ministry. LORD MANCROFT replied that it was hoped in future to be able to provide local authorities with an agreed programme for three or four years ahead, in order that they could acquire property in good time. The Ministry of Transport had a special planning section which was preparing a 20- to 30-year master plan for roads.

Middle East Trade Council

To keep the Government in touch with industries selling in the Middle East, the President of the Board of Trade has set up an Advisory Council on Middle East Trade. His Minister of State, MR. J. K. VAUGHAN-MORGAN, will be its chairman and Mr. W. H. McFadzean, of British Insulated Callenders' Cables, Limited, is to be vice-chairman and industrial leader of the Council. The other members are:

Mr. R. A. P. Bevan, O.B.E., S. H. Benson, Limited.
Mr. W. R. Beswick, Power-Gas Corporation, Limited.
Mr. M. R. Bridgeman, C.B.E., the British Petroleum Co., Limited.
Mr. G. C. R. Eley, C.B.E., British Bank of the Middle East.
Sir Norman Kipping, J.P., Federation of British Industries.
Mr. H. G. Nelson, The English Electric Co., Limited.
Mr. T. A. L. Paton, Sir Alexander Gibb and Partners.
Sir Henry Spurrier, Leyland Motors, Limited.
Mr. Frank Taylor, Taylor Woodrow, Limited.

Additional members may be appointed from time to time. The Council will also include senior representatives from the Treasury, the Foreign Office, the Board of Trade and the Export Credits Guarantee Department.

London Road Improvements

While congratulating the Minister of Transport on his courage in proposing an amendment to the Park Lane Improvement Bill to provide twin underpasses at Hyde Park Corner, MR. ERNEST DAVIES said his change of heart derived in part from inadequate information concerning traffic flows in London.

Unfortunately, he said, the Road Research Laboratory had nowhere near sufficient funds to carry out the essential investigation into traffic flows which was necessary if we were to embark upon the wise and expert traffic schemes for relieving road congestion. Only in that way could we make the necessary provision for the road improvements which would bring the greatest benefit to the largest amount of traffic. The same treatment (i.e. underpasses) should now be meted out to Marble Arch. The excess capacity provided there was far less than that which would be provided at Hyde Park Corner. MR. G. R. H. NUGENT, the Parliamentary Secretary, had said that the underpasses at Hyde Park Corner would provide a reserve capacity 70 per cent over the 1956 traffic figures. MR. R. GRESHAM COOKE commented that it was a pity that the scheme required the demolition of 148 Piccadilly (headquarters of the Society of Motor Manufacturers and Traders).

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AUTOMATIC SIGNALLING

(*Continued from page 3*)

stepping of the programme machine, and when the train selected by pressing the button is reached by the reading fingers, the machine will step twice, thus eliminating the train from the programme.

Kennington is an intermediate terminus on the southern (Morden) end of the Northern Line and has a loop and a central siding for the reversal of trains. A separate sequence programme machine is required for each of four paths and the machine is stepped once for the passage of each train. Each of the four sequence machines (one for trains ex Morden, one ex Kennington loop or siding, one each for the Charing Cross and Bank routes) has reference to a time programme machine, of which there are two at Kennington, making six machines in all. The time programme machine carries similar information to the sequence machine, but is not stepped for the passage of each train. It is stepped after the lapse of time representing the interval between the previous train and the train due. This it counts in half minutes, half-minute impulses being obtained from a master clock. The programme roll, by means of a special code, indicates the number of half minutes in the interval between each train and the next, and the time programme machine then counts these numbers of half minutes before stepping. In this way, the time programme machine only catches up with the sequence machine at the actual time that the train is due, and it is by checking the coincidence of the two programmes that the time is determined.

Time Machines

The time information from the time programme machine is used to give a warning, if the service is late, or to set in motion the alternative operation in the event of a train on a converging route being late. The time machine is also used for holding a train until it is time for its departure. For example, trains from the loop at Kennington are brought out into the Charing Cross northbound platform immediately it is clear, but the starting signal is not cleared until it is the correct time for the train to depart.

After the last train at night, the time programme machine takes complete control of the sequence programme machines, so that they are reset and step on to the first train position two minutes before the first train is due. Programme machine operation has been developed under the immediate direction of Mr. R. Dell, O.B.E., signal engineer, and to the general requirements of Mr. C. E. Dunton, chief civil engineer, London Transport. The machines are manufactured by the W. R. Sykes Interlocking Signal Co., Limited, and the cost of the scheme, which will enable considerable economies to be made, is to date £50,000.

Molten iron being charged into an open hearth furnace at Abbey Works

The ingot stripper bay at Abbey Works

The slabbing mill motor room at Abbey Works

LIGHTWEIGHT RAILBUS

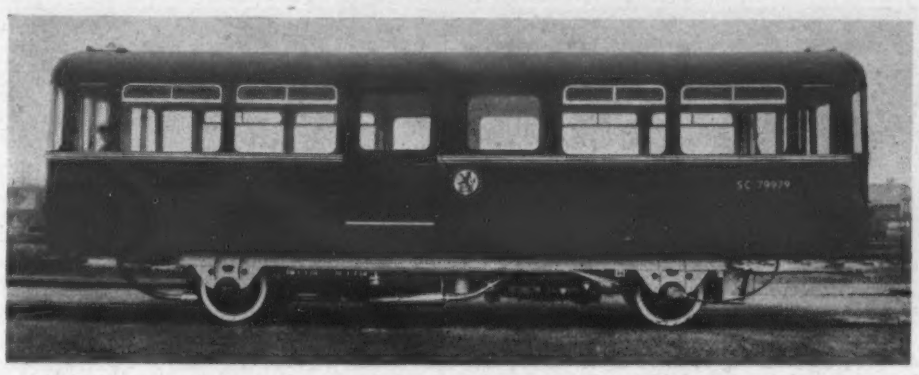
For Experimental Use in Rural Areas

ONE OF 22 FOR BRITISH RAILWAYS

LAST week the first of 22 lightweight diesel railbuses which are to be given extensive practical trials on selected services in rural areas was demonstrated by British Railways and showed itself a comfortable riding vehicle capable of running freely at up to 58 m.p.h. The railbus was designed and built by A.C. Cars, Limited, Thames Ditton, Surrey, to the requirements of the British Transport Commission. It is a four-wheeled vehicle with a weight of only 11 tons. It seats 46 passengers in two comfortable saloons and is powered by a single underfloor 150-h.p. bus-type diesel engine designed to operate it at up to 55 m.p.h.

Orders and Distribution

The railbus orders were placed with Bristol Commercial Vehicles (2), Park Royal Vehicles (5), A.C. Cars (5), D. Wickham (5) and Waggon und Maschinenbau of Donauworth, Germany (5). They will be introduced in the Eastern Region (5 vehicles), London Midland (4), Scottish (9) and Western (4). Their use may enable continuance of passenger services in rural areas which cannot be run economically with the normal diesel trains.



The first of the British Transport Commission's lightweight diesel railbuses built by A.C. Cars, Limited, weighs 11 tons and seats 46 passengers

LEADING DIMENSIONS:

Length over buffers	37 ft. 0 in.
Length over body	36 ft. 0 in.
Outside width over panels	8 ft. 11 in.
Overall height from rail (laden)	12 ft. 2½ in.
Inside width at waist rail	8 ft. 6 in.
Floor height from rail (laden)	4 ft. 3 in.
Interior height, floor to ceiling	7 ft. 4 in.
Wheelbase	19 ft. 0 in.
Wheel diameter	3 ft. 0 in.
Tare weight	Approx. 11 tons
Seating capacity	46

The railbus is arranged for control at each end; the driver is on the left-hand side. Each saloon has an offset gangway 1 ft. 5 in. wide at seat level, but increasing to 1 ft. 9 in. higher up due to a reduction in the width of the seat back. The seats are in a three and two layout in the centre of the car, with benches for three under the end windows. Upholstery is of uncut moquette with Vynide panels on Dunlopillo bases.

Windows and Doors

The side windows are Beclawat Zephyr type and have a lower portion of $\frac{5}{16}$ in. toughened plate glass surmounted by a light alloy framed sliding glass ventilator. The unit is glazed directly into the body framing by Claytonrite self-sealing weatherstrip. The end windows are ¼ in. laminated safety glass. Ventilation is by means of four extraction type units mounted longitudinally on the roof.

The Peters power-operated doors are situated centrally on each side of the car and are of the sliding type. Control of the doors is electro-pneumatic operated by push buttons at each of the driver's control positions. Release cocks are fitted adjacent to each door on the inside and outside of the car for use in an emergency, or to permit entry of depot staff. The leading edges of the doors are fitted with hollow rubber sections to ensure a draught seal and to provide protection for passengers. A pressure retaining check valve ensures that the air door reservoir is only fed after a pre-set safe minimum brake pressure has been attained. The reservoir is fitted with a water drain cock. The doors are arranged to slide into pockets formed in the vestibule sides, eliminating any danger to standing passengers. Both inner and outer walls of the pocket are provided with glazed portions; the inner one is framed and hinged to allow for glass cleaning. The vestibule is divided from the saloons by partitions. Vertical stainless steel pillars are fitted at the inner ends of the partition to provide a barrier for the glass and for use as grab pillars. Racks are provided along each side of the car terminating at the central vestibule and there is a generous luggage space by the door.

Driver's desk in the A.C. railbus and, right, the seating layout

Car Body

The car body is a light steel shell fabricated by welding from top hat channel and zed sections. The floor consists of corrugated steel section attached by welding to the body longitudes and cross members. The steel floor is covered by a wood composition floor and is finished by linoleum. Exterior panelling is of 16 s.w.g. aluminium for the sides and ends and 18 s.w.g. aluminium for the roof panels. Generally, the panels are riveted to the framework and panel joints are covered with a moulding. Electrolytic action between the aluminium panels and steel frame is controlled by a jointing medium. Ceiling panels, also of aluminium, are 20 s.w.g., the end domes are formed from 18 s.w.g. Where necessary the panels are treated with sound-absorbing material.

Suspension

The body shell is suspended at each corner of the underframe by means of special rubber springs acting in shear and compression with hydraulic dampers to prevent undue oscillation. Springing between the axle box and the underframe is by Metalastik rubber shear-compression units specially designed for this purpose. These units consist of rubber, moulded and bonded to steel plates of chevron shape. Each SKF roller-bearing axlebox carries two units mounted at an angle relative to each other; this angle determines the ratio of shear to compression. Stiffness in the horizontal direction is very high due to the rubber being mainly in compression in this direction. Lateral stiffness is given by the chevron formation of the units.

Power Unit

This power unit comprises a British United Traction 150 h.p. six-cylinder horizontal diesel engine driving through a fluid flywheel, thence through a free wheel unit to a four-speed Wilson epicyclic gearbox. A shaft takes the drive through a universal joint to the final drive unit, mounted centrally on one of the axles. The torque reaction is taken by an arm attached to the underframe and incorporates rubber buffers to absorb shock loads. The final drive unit also incorporates the forward and reverse gears. Throttle, gearbox and direction gear are operated through electro-pneumatic valves, the air supply being drawn from the system after the brake reservoirs have reached a pre-determined pressure. Combustion air for the engine is taken through a large air filter and thence to the manifold by flexible pipe.

Air is drawn through the radiator in the engine cooling system by an engine-driven fan enclosed in a cowl attached to the radiator body. A header tank incorporating a filler is mounted above the engine to ensure that no steam locks form in the cooling system. This tank also incorporates a low-water-level switch. The fuel tank capacity is 50 gal. Air-pressure brake-operating equipment and compressor of Clyaton Dewandre manufacture incorporates Bendix-Westinghouse-type brake valve.

The compressor, of 15 cu. ft. min. capacity, is driven through vee belts from the input end of the gearbox. Air is drawn through a filter and anti-freezer and connections to and from the compressor are flexible to allow for belt adjustment and vibration. The control panel and generator are by J. Stone; the generator is also driven from the input end of the gearbox.

Nife alkaline batteries are suspended at the side of the underframe. Protection is given by a timber battery box with a hinged side to allow for servicing the 19-cell 200 amp.-hr. batteries.

Drawgear and Buffers

With this type of railbus design it is inherent that the drawgear and buffers cannot be mounted directly to the underframe. They are therefore carried by the body frame and in this position cannot be expected to withstand the normal usage and shunting stresses. They are fitted as a means of towing the railbus in the event of a failure whilst on the track and are adequate for that duty.

Heating is by means of one Smith's combustion unit operating from the same fuel as the power unit. The unit is mounted on the underframe, fresh air being drawn through a filter before heating and then ducted to emit at a number of points beneath the seats. A Smith distance counter is fitted. Despite the naturally hard riding of a four-wheeler on sharp curves and through the double and single slips in the trackwork of the route traversed on a trial trip, the riding in general was of an excellent order and it was difficult to realise the speed even when the railbus was running at its maximum. Performance was lively—leaving Marylebone with a full load, 42 m.p.h. was attained on the 1 in 196 in St. John's Wood Tunnel and 36 m.p.h. was maintained on the 1 in 95 at Cannfield Place.

QUADRUPLING THE GREAT NORTHERN LINE

Hadley Wood and Potters Bar Tunnels

UNIQUE CONCRETE LINING SYSTEM

IN order to extend the continuous four-track section of the East Coast main line out of Kings Cross on the Great Northern Line of the Eastern Region, the two-track section, about 2¼ miles long between New Barnet and Potters Bar stations, is being quadrupled. The work involves duplication of three double-line tunnels 384 yd., 232 yd. and 1,214 yd. long near the top of the 1 in 200 bank. The former Great Northern Railway obtained powers for this work as long ago as 1882.

The delay in completing the quadrupling of so important a main line at a point in such close proximity to the London terminus is explained by the construction of the Hertford loop line from Enfield to Stevenage; it provides an alternative, although slightly longer, route to the north from Kings Cross. Construction works upon the loop were completed in the early days of the 1914-18 war, but the line was not fully opened to traffic in both directions until the middle 1920s. Included in the Hertford loop are two tunnels, of which the longer, at Ponsbourne, over a mile in length, was the last double-track tunnel of importance to be constructed in clay by a main-line railway company in Great Britain, until the present task was commenced in 1955 in the same type of ground and through a similar ridge to the west of Ponsbourne.

Altered Technique

This gap, of no less than 40 years, has, owing to vastly changed economic conditions, resulted in the consideration of totally different tunnelling techniques. Whereas Ponsbourne Tunnel was constructed by the traditional English method, and lined with seven rings of brickwork, such a system, involving so great a number of miners, was out of the question. Further, suitable bricks were in short supply and also expensive, but even if this had not been the case, bricklayers used to new tunnel work are scarce.

The problem was considered over some considerable period, and the stability of the existing tunnels, which must remain open to intensive traffic throughout the works, was also taken into account. The dearth of large, soft, new tunnelling works has naturally produced a scarcity of engineers familiar with such products. In consequence, the Eastern Region of British Railways approached Sir William Halcrow and Partners, consulting engineers, and asked for suggestions. The design of tunnel now being carried out was put forward by Mr. H. D. Morgan of that firm. Apart from this consultation and the detailed design of the tunnels as well as the appropriate parts of the contract document, all the drawings and the design of the scheme as a whole were undertaken at Kings Cross in the chief civil engineer's office.

Concrete to Resist Acid

The design is novel and has certainly not been executed in Europe, if indeed it has been tried anywhere. The lining is in precast concrete units with dry joints and, owing to the use of steam locomotives for some years to come, the cement employed in all units and in the shafts, but excepting the large invert segment, is Sealithor metallurgical supersulphated cement, which, by experience, has been shown as being capable of withstanding the attack, inter alia, of dilute sulphuric acid which can wreak much damage.

This primary concrete lining, which has been designed for these tunnels, is specially suited to the stiff London clay in which the tunnels are situated. Each ring of lining comprises a reinforced invert unit and 19 plain pre-cast voussoirs, the rings being 18 in. wide, 27 in. deep and built to an internal diameter of 26 ft. 6 in.

Driving Method

The tunnels are driven in 31-ft. diameter shields fitted with hydraulically operated erector arms for setting the voussoirs, in the crown of the tunnel, into position. When the face of the excavation has been sufficiently advanced, the shield is pushed forward by propelling rams bearing against the last completed ring of lining, to allow the next ring to be assembled immediately behind the shield. The units of the ring are then forced tightly against the ground by means of jacks set in slots between pairs of special voussoirs situated in the waist and at each side of the tunnel. The jacks are subsequently replaced by a very dry concrete pinning, introduced in two stages so as to avoid any release of the ground load on the ring. A high-grade concrete is necessary for the lining units, with 29-day compression strengths in the region of 7,000 lb. p.s.i.

Where openings occur in the tunnels for refuges and for the throats of air shafts, special methods are adopted, including the use of concrete shear keys between adjacent rings, to support the loads on an incomplete ring. High strength steel tension rods are also incorporated. Spoil excavated from the tunnels is transferred by conveyor belt to a hopper behind the shield and thence to skips which are hauled by diesel locomotive on 2-ft. gauge track to a tip site adjacent to the tunnels.

Portals

The tunnel portals are being built oversize initially, to permit the passage of the shield, the thrust from the propelling rams being transferred by temporary rings of lining and trestled piles to the ground outside the tunnel for the start of the operation on each tunnel. Blue engineering brick is used for the portal facings.

The design of precast concrete lining requires no fastenings between rings and dispenses with grouting outside the lining. The cost will be less than 40 per cent of the figure for lining throughout with conventional cast-iron segments.

The widening of the main line involves the rebuilding of Hadley Wood Station; the design of the platform buildings and the remodelling of the existing booking hall, goods office, parcels office, etc., are now in hand. The platform buildings will be undertaken on a prefabricated modular system of construction.

The present down platform at Hadley Wood Station will be widened and will become an island

(*Continued on page 16*)

CYCLE OF TUNNELLING OPERATIONS

Assuming that the shield is ready to be driven from a completed ring of concrete segments, the operations are undertaken in the following order, the complete sequence takes about 2-2½ hours. First, the shield is driven forward about 1 ft. 6 in. by jacks pushing against the completed ring. In moving forward, the shield draws behind it the conveyor belts and hopper which deal with spoil. Then, the shackles which attach the tail of the shield to the crane platform, etc., are uncoupled and the jacks withdrawn. This enables the invert unit to be placed immediately behind the shield.

The lining units are thirdly built up on each side to about the horizontal axis of the tunnel; during this period the retractable portion of the conveyor is moved forward so that the excavated material can be removed to the hopper. Fourth, the units above the horizontal axis are then placed on specially designed arms shaped to the inner radius of the tunnel. These arms are hydraulically operated, and the units are placed and pushed up so that they are within a few inches of their final position.

Fifthly, the crown unit is carried up in a special hoist and is held in position until completion of the final operation. This, sixth in the cycle, is to insert jacks in the recesses in units near the horizontal axis of the tunnel; each group of segments is lifted upwards until it is in close contact with the clay. The erector arms are then withdrawn and the ring forced back by the propelling rams on the shield to interlock with the preceding ring. The jacks are then further extended to thrust the periphery of the ring against the ground. A dry concrete pinning is placed to each side of the jack and, subsequently, the jacking recess is filled in a similar manner. The cycle of operations is then repeated.

Duplicating the Great Northern main line: Completed tunnel portals at Hadley Wood North with shield commencing to drive against dumpling; spoil conveyor plant at Potters Bar Tunnel south portal, showing invert unit on narrow-gauge truck; hoisting a set of concrete lining units into position beyond the initial cast-iron rings; right, completed work on concrete-lined tunnel

ROAD VEHICLE INDUSTRY

Guy Victory Single-deck Bus

NOW available from Guy Motors, Limited, Wolverhampton, is a new illustrated brochure describing the Victory underfloor diesel-engined single-deck passenger chassis. The Victory has been designed for high performance at a gross weight of 13¼ tons and has a flat-topped chassis frame which is available with or without outriggers for semi-integration of the body. An 18-ft. standard wheelbase permits a body up to about 36 ft. long and over 8 ft. wide, making it particularly suitable for overseas operators. Power is provided by a Meadows 6HDC500 horizontal diesel engine of 8 litres capacity, which has an output of 150 b.h.p. at 2,400 r.p.m. and 346 lb./ft. torque at 1,400 r.p.m. Choice of transmission can be made from a wide selection of different arrangements including five-speed direct- and overdrive-top constant-mesh and synchromesh gearboxes and four-speed direct-top and five-speed overdrive-top air-operated planetary gearboxes. The rear axle has spiral-bevel gear and fully floating half shafts. Suspension is by progressive semi-elliptic leaf springs and tyres are twin 10.00-20 on the rear and single 11.00-20 16-ply Michelin Metallic on the front. Both accelerator and clutch (with countershaft gearbox) are hydraulically operated and two-leading-shoe brakes all round employ dual Bendix-Westinghouse air-pressure operation.

Guy Distributor in Eire

THE firm of S. McGormick, Limited, which already holds the franchise for Guy Motors in Northern Ireland, has been appointed official Guy distributor in Eire. The headquarters of the company are at Jamestown Road, Inchicore, Dublin.

Heavy-Duty Batteries with F.S.C.

FOLLOWING the successful introduction of Golden Crompton car batteries with F.S.C. (factory sealed charge) last year, Crompton Parkinson, Limited, is now introducing the F.S.C. feature to its range of heavy-duty commercial vehicle batteries. Dry charged and sealed during manufacture, the batteries retain their factory-fresh condition until they are actually required for service, when the seals are broken and the acid added to activate the latent dry charge. Due to their construction the heavy-duty batteries then require —unlike the car batteries—a relatively short normal charge before they can be used. The charge required is for only from eight to 12 hours, dependent on the size or type of battery, compared with the 12-hour soaking time and 80 to 100 hours initial charge necessary with the normal type of heavy-duty battery.

The first four of 44 Leyland Titan buses ordered by Nottingham City Transport being inspected by city officials on the Trent embankment. They are the first Leyland diesel-engined buses to be operated by Nottingham, though a fleet of Leyland trolleybuses was supplied early in the 1930s

Italian Production and Exports

DURING 1957, the Italian motor industry produced a total of 351,799 vehicles of all types, including 33,311 commercial vehicles, showing an 11.4 per cent increase on 1956 production. Exports for 1957 amounted to 119,123 vehicles (8,170 commercial vehicles), or nearly 34 per cent of production.

Bedford-Grosvenor Grafton Super

A NEW de-luxe 12-seat version of the Grosvenor Grafton personnel carrier is now in production by the Grosvenor Carriage Co., Limited. The new Grafton Super, like the normal Grafton (which continues in production), is converted from the Bedford light van. It utilises the engine and gearbox of the Vauxhall Victor car but has heavy-duty rear springs and 6-ply tyres. Externally, the appearance is improved by the use of bigger side-windows incorporating a central ventilator panel and dual colour schemes are standard. Internally, the Super has several differences of design and finish compared with the normal Grafton. The fixed rear seats, extending down each side are flat and have arm-rests at each end. To give clear access front to rear, the centre cushion of the intermediate seat lifts up and the squab hinges sideways instead of forward. The double seat and squab alongside the driver fold right forward, giving a clear entrance to the intermediate seats. The folding step at the rear and the side entrance step to the nearside door are as fitted to the Grafton. Price of the Grafton Super is £617 15s. (no purchase tax), £41 more than the Grafton.

Pump Aid for Twin Tyres

INCORRECT tyre pressure is well known to be one cause of rapid tyre wear, and in the case of twin tyres on commercial vehicles, the comparative inaccessibility of the inner tyre valve adds to the possibility that tyres will not be maintained at specified pressures. An inexpensive device to overcome the problem named Liha Pump Aid has been introduced by E. F. Allchin and Co., Limited, 253 Bordesley Green, Birmingham, 9. The device consists of an extension hose with valve for the inner tyre and a mounting bracket for fitting to the outer wheel studs, where the valve is easily accessible. Sets are available to fit all sizes of wheel and dual sets are available where it might be an advantage to fit to both inner and outer wheels, bringing both valves close together and so saving time when adjusting pressures.

Improved Vacuum Braking System

IMPROVED overall braking performance of the widely used triple-servo vacuum braking system is provided by a modification developed by Clayton Dewandre Co., Limited, Lincoln. The standard vacuum triple system comprises a vacuum master servo operating the rear brakes mechanically and two individual front-brake vacuum motors, which are mounted over the stub axles and controlled by the distributor valve in the master servo. The recent tendency to increase the proportion of front-wheel braking by increasing the volume of the front-wheel cylinders has aggravated the slight but undesirable lag in front-brake application inherent in the system. The delay is obviated by the modification, which comprises the fitting of a relay valve in the vacuum system as close to the front-brake motors as possible, and an auxiliary vacuum reservoir in cases where the main reservoir is remote from the front brakes.

Pyrene Mark VI heavy-duty airfield crash tenders on Rolls-Royce 238-b.h.p.-engined Alvis Salamander six-by-six chassis ready for delivery to the Royal Canadian Air Force. Capable of high speed across country and of projecting over 10,000 gal. of foam in 2 min., they form part of an order worth 1½ million Canadian dollars

Acheson Assembly Bulletin

JUST published by Acheson Colloids, Limited, 18 Pall Mall, London, S.W.1, is a four-page folder entitled *Lubrication in Assembly and Running-in*. Numbered 100 in the Sales Bulletin series, it describes the advantages of dag colloidal graphite as a protective lubricant during assembly and running-in and there is a section on dry pre-assembly treatment using colloidal graphite or colloidal molybdenum disulphide.

Cheat-Proof Excess Fuel Device

A NOVEL excess fuel device for diesel engine starting which can only be used at the time of starting the engine and cannot be misused for obtaining excess fuel under normal running conditions has been introduced by Simms Motor Units, Limited. The device is fitted to the fuel pump body registering with the end of the control rod or rack and is operated by turning a knurled outer cover through 45 deg. A torsion spring immediately returns the cover to the normal position. A system of levers prevents the rack moving into the excess fuel position when the engine is running, even if the outer cover is not permitted to return to its normal position by being fixed in some way.

LETTERS TO THE EDITOR

The Purpose of Port Victoria

SIR,—Dr. Rees's interesting article in your issue of February 15 gives the impression that a route to Holland operated via Port Victoria as a rival to that via Queenborough. Although it may have been the intention of Sir Edward Watkin to foster cross-Channel services from the new pier, I believe that in the event the only real competitive use to which the South Eastern put Port Victoria was for the Sheerness traffic. Its two small vessels—the p.s. *Myleta* and p.s. *Edward William*—were employed on the Medway crossing and thus provided a throughout route from London to Sheerness shorter than the "overland" route of the London Chatham and Dover via the Swale Bridge. It is true that for a short period at the beginning of this century, the English terminal of the Zeeland company's Flushing service was transferred to Port Victoria, but that was after the working union between the two railway companies had become operative and was in consequence of a fire at Queenborough Pier.—Yours faithfully,

J. L. HARRINGTON.

Maubriern,
South Drive,
Dorking, Surrey.

Road Transport Economics

SIR,—I am left bemused and bewildered by the juggling feat with taxes from one form of transport to another indulged in by your correspondent Mr. R. G. R. Calvert in your issue of February 8.

May I ask him simply what justification on economic grounds he has for taxing one form of transport at the expense of another?—Yours faithfully,

C. D. MORGAN,
Secretary,
British Road Federation.

26 Manchester Square,
W.1.

Audible Warnings to Engine Drivers

SIR,—To give an engine driver audible warning and a partial brake application when a distant signal is at caution is fundamentally wrong. It is only natural that drivers will come to rely upon it, particularly under fog or snow conditions; the next step is too much reliance thereon and, too little vigilance.

Passing a stop signal at danger should under any circumstances be the worst offence drivers can commit. The warning idea should be replaced by the more positive stop at a stop signal. Put the electro magnets at stop signals and adapt the operation so that a full brake application results. This will bring the train to a dead stand irrespective of any action the driver may take. Follow up by so placing the resetting valve as will ensure the driver getting off the footplate on to the permanent way to reset it; also add an indicator in the cab which will show the emergency application to have been made and make it that the indication cannot be erased by a driver. This would give a full safety factor and tend rather towards increased vigilance on the part of the enginemen. There is much in "Better be safe than sorry."—Yours faithfully,

W. ROSE.

19 Darley Road,
Manchester, 16.

Forthcoming Events

February 22.—Permanent Way Institution (Manchester and Liverpool). Paper by Mr. R. W. Bailey, "Work Study." At Conference Room of District Engineer's Office, Central Station, Liverpool. 2.30 p.m.
Light Railway Transport League. Paper by Mr. T. Rowe, "Some Steam Light Railways of West Germany." At 153 Drummond Street, N.W.1. 3 p.m.

February 24.—Omnibus Society. Paper by Mr. J. G. Shave, "Maintenance of Buses on London Transport." At Victoria Coach Station, Buckingham Palace Road, S.W.1. 6.45 p.m.
Light Railway Transport League. Paper by Mr. R. B. Parr, "The Grimsby and Immingham Light Railway." At 2 Jesmond Road, Newcastle upon Tyne. 6.45 p.m.
Stephenson Locomotive Society (Midland). Paper by Mr. R. A. Savill, "The North Eastern Region of British Railways." At Exchange and Engineering Centre, Stephenson Place, Birmingham 7.15 p.m.

February 25.—Institute of Transport (Leeds G. and S.). Paper by Mr. G. W. Battensby, "Looking Back." At 1 Swinegate, Leeds, 1. 7 p.m.
Railway Correspondence and Travel Society (East Midland). Paper by Dr. R. F. Youell, "11 Passengers per Second—the G.E.R. Suburban Services." At N.C.S. Guild Room, Toll Street, Nottingham. 7.30 p.m.
Stephenson Locomotive Society (Midland) and Railway Correspondence and Travel Society (West Midland). Paper by Mr. L. R. Agutter, "The Railways of Finland and North Europe." At 64 Holyhead Road, Coventry. 7.30 p.m.

February 26.—British Institution of Radio Engineers. Paper by Mr. C. Powell, "Dectra: a Long-range Navigational Aid." At London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1. 6.30 p.m.
British Institution of Radio Engineers (South Wales). Paper by Messrs. R. Swinden and J. E. H. Brace, "Industrial Television." At Glamorgan Technical College, Treforest. 6.30 p.m.

February 27.—Institution of Electrical Engineers. Annual dinner. At Grosvenor House, Park Lane, W.1. 7 p.m.
Institute of Transport (Bournemouth—Poole). Debate, "Road versus Rail." At Town Hall, Bournemouth. 6 p.m.
Institute of Transport (Leicester). Open night and film display. At City Transport Offices, Leicester. 7.30 p.m.
Institute of Transport (South Eastern). Paper by Mr. J. Hawkes, "Air Ferry Integration with Surface Transport for the Carriage of Passengers." At Royal Star Hotel, Maidstone. 7.15 p.m.

February 28.—Institute of Transport (Tees-side). Annual dinner and dance. At Hinten's Restaurant, Middlesbrough.
Institution of Railway Signal Engineers (Bristol). Paper by Mr. M. E. Leach, "Train Describers." At Meeting Room above Main Booking Hall, Temple Meads Station. 6 p.m.
Institution of Mechanical Engineers. Paper by Messrs. L. J. Cheshire, J. V. G. Evans and P. H. W. Wolff, "The Design and Construction of the Compressor for the 8-ft. by 8-ft. High-speed Wind Tunnel at R.A.E., Bedford." At 1 Birdcage Walk, S.W.1 6 p.m.
British Institution of Radio Engineers (South Midlands). Paper by Mr. P. H. Blundell, "Some Advanced Application on Information Theory." At North Gloucestershire Technical College, Cheltenham. 7 p.m.

March 1.—Railway Correspondence and Travel Society. Annual general meeting. At Railway Clearing House, Eversholt Street, N.W.1. 6.30 p.m.

SOCIAL AND PERSONAL

Death of Mr. F. D. Ascoli

WE record with regret the death of Mr. F. D. Ascoli, whose outstanding experience in latex manufacture in the service of the Dunlop Rubber organisation enabled it to establish a world market for latex, especially in America. He introduced the centrifuging process in Malaya in 1930 and was later responsible for the shipment in bulk of this raw material. Mr. Ascoli, who was 74, was managing director of Dunlop Plantations, Limited, until retirement in 1955. He was a past president of the Institution of the Rubber Industry.

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We regret to record the death of Mr. T. H. W. Hitchins, spare parts superintendent of A.C.V. Sales, Limited.

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Captain F. Ardern, D.S.C., who is a Younger Brother of Trinity House, has been appointed general agent of British Railways for Ireland, located in Dublin. Since 1952 he has been district marine manager and harbourmaster at Holyhead.

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Mr. H. Kinsey who has been appointed district commercial officer, Liverpool Street, in the new Eastern Region traffic organisation, entered the service of the L.N.E.R. at Filey in 1926. He was appointed a traffic apprentice in 1933 and after completion of his training in 1936 held various positions in the commercial and operating departments. In 1948 Mr. Kinsey was appointed acting assistant district goods manager, Eastern Region, Manchester, where he remained until 1951, when he moved to Liverpool Street as head of the terminals section in the office of the commercial manager, Eastern Region. His appointment as goods agent, Kings Cross, followed in 1953 and he returned to Liverpool Street the following year as terminals assistant to the commercial manager, Eastern Region, becoming planning assistant to commercial manager, Eastern Region, in 1955.

Mr. H. Kinsey

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Mr. H. C. Maguire export sales manager of the Marconi International Marine Communication Co., Limited, left London Airport on Tuesday this week on the B.O.A.C. flight to Hong Kong, where he was to discuss possibilities for further marketing of Marconi Marine equipment in China.

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The annual general meeting of the National Road Passenger Transport Ambulance Association, of which Mr. John Burnell, operating manager, Central Road Service, London Transport, is president, was held in London on February 13. Mr. H. D. Lewis, 68 Flora Street, Cathays, Cardiff, is hon. secretary of the Association.

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Appointed district commercial officer, Lincoln, in the new Eastern Region traffic organisation, Mr. C. A. M. Peaty, A.M.Inst.T., was educated at Fettes College, Edinburgh, whence he proceeded with an open scholarship in classics to Gonville and Caius College, Cambridge. He graduated with first-class honours and in 1931 commenced a special training course with the Great Western Railway. In 1941 he was appointed senior assistant to the district goods manager, Gloucester, and in 1946 was made assistant to the district goods manager, Worcester, the post being re-designated assistant to the district commercial superintendent, Worcester, on reorganisation in 1950. In 1955, after having acted for a year as assistant district commercial superintendent, Worcester, he was promoted to the post of goods agent, Swansea, and early the following year he was appointed assistant district commercial manager, Swansea, the post which he vacates to take up his new position.

Mr. C. A. M. Peaty

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Mr. J. Strong, a director of the British Oxygen Co., Limited, has relinquished his appointment as chairman of Quasi-Arc, Ltd., on being appointed chief executive director of British Oxygen Gases, Limited.

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Following the death of Mr. E. R. Pritchard and the retirement of Mr. L. W. S. Grinling at the end of December, 1957, Messrs. H. G. Sorrell, O.B.E., J. N. Burrell and H. Maitland Clarke have become assistant managing directors of Coast Lines, Limited.

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At a dinner in London last week the employers' side of the National Joint Industrial Council for the Road Passenger Transport Industry entertained Mr. Frank Coyle on his retirement (on March 1) for health reasons from his appointment as national secretary of the passenger services group of the Transport and General Workers' Union, held for the past 24 years. His successor is Mr. A. Townsend.

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Mr. M. F. Barbey, A.M.I.C.E., has been appointed to the post of district engineer, Hull, North Eastern Region, B.R. He joined the former L.M.S.R. in 1927, in 1953 became assistant district engineer, Barrow-in-Furness, and in 1956 assistant district engineer, Leeds, North Eastern Region. Later that year Mr. Barbey was appointed assistant (bridges), chief civil engineer's office, York, the post which he now relinquishes.

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Mr. F. Everitt, E.R.D., T.D., A.M.I.C.E., deputy district engineer, West Riding, has been appointed to the post of district engineer, Darlington, North Eastern Region, B.R. Mr. Everitt commenced his railway service in 1929 in the L.M.S.R. divisional engineer's office at Crewe. He was made works maintenance assistant to the civil engineer, North Eastern Region, in 1952, and in 1955 became district engineer, Bradford. He was appointed deputy district engineer, West Riding, early last year.

The late Mr. J. McGregor, managing director of Key Warehousing and Transport Co., Limited, Hull, left £20,314 gross in his will.

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We regret to record the death, at the age of 59, of Mr. J. M. Powell, A.M.Inst.T., who had been transport manager of Pontypridd U.D.C. Transport Department since 1938.

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We regret to record the recent death of Mr. P. R. Hickman, O.B.E., who was chief officer (stores), Railway Executive, at the time of his retirement in 1952. He was 66.

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Wakefield-Dick Industrial Oils, Limited, has appointed Mr. J. W. MacMahon general manager of its industrial lubricants division in succession to Mr. R. J. Turner, retired.

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The Canadian Pacific Railway has elected Sir George Bolton, a director of the company to fill the vacancy created by the death of Viscount Waverley. Sir George Bolton has been executive director of the Bank of England since 1948.

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Mr. F. M. Wright, M.B.E., who has been appointed district commercial officer, Kings Cross, Eastern Region, B.R., was educated at Rutherford College, Newcastle upon Tyne. He joined the former L.N.E.R. in 1933 and obtained experience in the commercial, operating and docks departments in the North Eastern Area. On the outbreak of war he joined H.M. Forces and rose to the rank of lieutenant-colonel in the Royal Engineers. Having returned to railway service Mr. Wright was appointed a traffic apprentice and after completion of his course he became assistant yardmaster, Annesley. In 1951 he was made traffic agent, Consett, and two years later he moved to Darlington as goods agent and yardmaster. In 1954 he was promoted to assistant district commercial manager, York, and the following year he moved to a similar position at Lincoln. In 1957 he became acting district commercial manager, Peterborough.

Mr. F. M. Wright

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Mr. W. E. Cone, technical adviser of the British Road Tar Association, will shortly retire, having occupied that office in the Association since its inception in 1927. His services are being retained in an advisory capacity.

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On February 12-15, the London Transport Players presented *White Horse Inn*, by Hans Muller, at the Scala Theatre. The occasion proved to be a most enjoyable one and it is not surprising that all seats were booked for each performance.

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Mr. I. R. Gamble, who has been appointed district commercial officer, Peterborough, Eastern Region, B.R., joined the staff of the Midland and Great Northern Joint Committee in 1922 in the traffic manager's office, King's Lynn. After station experience in 1936, on the absorption of the M. and G.N. by the London and North Eastern Railway, he was transferred to the L.N.E.R. goods manager's rates department. And after a period in the advertising managers' department was in 1938 appointed assistant industrial agent, chief general manager's office. He was made assistant district goods manager (London suburban) in 1941 and five years later, in 1946, he became assistant district goods and passenger manager, Peterborough. In 1948 he returned to London as assistant district passenger manager, London, the position which he vacated to take up his present appointment.

Mr. I. R. Gamble

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Mr. H. E. Hill, F.C.A., has been appointed a director of Associated Commercial Vehicles, Limited, and at the same time resigned from Park Royal Vehicles, Limited.

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Mr. L. Holmes has been appointed assistant (claims), chief traffic manager's office, Leeds, North Eastern Region, B.R. Mr. Holmes commenced his service with the Great Central Railway Company at Grimsby Docks in 1921 and has been in the claims section in the chief traffic manager's office since 1956.

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Mr. J. D. Mundella, M.I.R.T.E., has been appointed chief engineer of East Midland Motor Services, Limited, in succession to Mr. P. H. W. Smith who is taking over a similar appointment with the Trent Motor Traction Co., Limited. Mr. Mundella was previously assistant engineer, North Western Road Car Co., Limited, and from 1955 assistant chief engineer, Birmingham and Midland Motor Omnibus Co., Limited.

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Sir Ivan A. R. Stedeford, K.B.E., has been appointed chairman of Reynolds TI Aluminium, Limited, with Mr. R. S. Reynolds, jnr., as alternate chairman and Lord Reith, Messrs. W. G. Reynolds, J. L. Reynolds, J. H. McConnell, A. J. S. Aston and R. D. Young as directors. Reynolds TI Aluminium was formed in November last to combine the interests and activities of Tube Investments and the Reynolds Metals Group of the U.S.A. in the aluminium industry in the United Kingdom.

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The annual dinner of the Yorkshire section of the Institute of Transport took place at the Great Northern Hotel, Leeds, on February 7. The president, Sir Reginald Wilson, responded to the toast "The Institute of Transport" proposed by Alderman W. R. Hargrave, Leeds City Council. The toast "Our Guests" was proposed by the chairman of the Yorkshire section, Mr. R. E. Clough, who presided, and responses were given by Mr. Arthur Tiley, M.P. for Bradford West, and by Mr. N. H. Dean, chairman of the Sheffield section.

IMPORTANT CONTRACTS

Napier Eland Earns Dollars

WORTH between four and five million Canadian dollars, an order has been placed for Napier Eland turboprop engines to power 10 Cosmopolitan medium-range transport aircraft ordered by the Canadian Government from Canadair, Limited, Montreal, for the R.C.A.F. Air Transport Command. The Cosmopolitan is a combination of the airframe of the American Convair 440 and the British Eland propeller turbine designed and built by D. Napier and Son, Limited, a member of the English Electric aviation group. Three years ago, as a private venture, Napier fitted Eland engines in a Convair and last November demonstrated this aircraft to the Royal Canadian Air Force in Ottawa. The aircraft is now in California undergoing Civil Aeronautics Administration airworthiness tests. The Elands, which will be built at the Napier Liverpool factories, will be supplied as complete powerplants to Canadair and deliveries of the completed aircraft will begin next year.

New Cranes for the Hartlepools

Orders have been placed in connection with the scheme announced last October for improved facilities at Hartlepools Docks with Stothert and Pitt, Limited, for 10 3-ton cranes and one 10-ton crane, and with Cowans Sheldon and Co., Limited, for one 10-ton grab crane.

South Wales Docks Contracts

The British Transport Commission (South Wales Docks) has placed the following contracts:

South Wales Switchgear, Limited, for renewal of crane power supply services at South Quay and North Dock, Newport.

Fairfield Shipbuilding and Engineering Co., Limited, for two all-welded steel limpet dams for work on outer gate fittles, Port Talbot.

A.E.C. Diesels Earn Dollars

A.E.C. 11.3-litre diesel engines are specified for 325 buses ordered by the Montreal Transport Commission from the Canadian Car Co., Limited. To date, over 1,500 engines of this type have been supplied by the export division of A.C.V. Sales, Limited, to Canada in addition to hundreds of other types. Production of the buses will begin immediately at the Can-Car plant at Fort William, Ontario, and deliveries are expected to be complete by the autumn.

Ceylon Transport Board Orders British

The first orders to be placed by the Ceylon Transport Board since it took over the nationalised bus services in January has resulted in a £250,000 contract with the Leyland Motors group for 100 Leyland Comet vertical-engined buses, 20 Albion Aberdonian underfloor-engined buses and five Tiger Cub underfloor-engined buses. A fleet of 55 Tiger Cub buses was ordered from Leyland Motors by the board last autumn, when it was also reported that 165 Mercedes-Benz buses might be ordered from Germany.

New Stock for Newfoundland Lines

Canadian National Railways has placed orders for 128 new freight wagons and work equipment units for the Newfoundland district. The Eastern Car division of Dominion Steel and Coal Corporation will build 20 air-dump work wagons and 15 livestock wagons, while Canadian Car Co., Limited, will supply 80 refrigerator wagons and 13 hopper wagons, all specially designed for service on the Newfoundland lines. The orders total $1,700,000 and delivery is expected to be completed during the first half of this year. The rolling stock position in the province, which has been gradually improved by C.N.R. since 1949, will be further enhanced this year by delivery of three 1,200-h.p. diesel-electric locomotives and two 60-ton depressed-centre flat wagons previously ordered.

British Waterways Contracts

British Transport Waterways announces the following contracts:

Crone and Taylor (Engineering), Limited, St. Helens, for two Big Walrus mobile loaders for use on North Eastern waterways.

P. Kierman, Leeds, for construction of a new lock house at Conisbrough Lock on the Sheffield and South Yorkshire Navigation.

E. Somerfield and Son, Limited, Nottingham, for structural alterations to warehouse and transit shed at Trent Lane, Nottingham, to provide improved storage space.

United Kingdom Construction and Engineering Co., Limited, Kirkby, for raising of bridge approaches and overhaul of Plank Lane Bridge on the Leigh Branch of the Leeds and Liverpool Canal (due to mining subsidence).

Work to be undertaken by direct labour includes bank protection work near Vale Royal Lock, on the Weaver Navigation. A deep water berth is to be constructed to provide improved accommodation for craft waiting to discharge coal at Whitebirk Power Station, Blackburn, on the Leeds and Liverpool Canal.

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TENDERS INVITED

THE following items are extracted from the Board of Trade Special Register Service of Information. Inquiries should be addressed, quoting reference number where given, to the Export Services Branch, Board of Trade, Lacon House, Theobalds Road, London, W.C.1.

February 28—Belgian Congo.—Ministry of Colonies, Brussels, for TYRES and TUBES to an estimated value of B.Fr.2,000,000. Photocopies of tender documents from Export Services Branch, B.o.T., price 12s. (ESB/3689/58.)

March 3—Formosa.—International Co-operation Administration for 18 sets (8 right turn, 10 left turn) No. 16 TURNOUTS and 18 sets No. 12 TURNOUTS, all in 37 kg. rail. Tenders to the Central Trust of China, Purchasing Department, 68 Yen Ping Nan Road, Taipei, Taiwan. (ESB/3067/58/ICA.)

March 3—Spain.—Ministry of Public Works for two 115-h.p. 5 ft. 6 in. gauge DIESEL-MECHANICAL LOCOMOTIVES for the port of Huelva. Tenders to the Secretary, Dirección General de Puertos y Señales Marítimas, Paseo de Atocha 1, Madrid. (ESB/3466/58).

March 4—Turkey.—Allied Land Forces, South Eastern Europe, for five 37-43 seat 150-h.p. petrol-engined BUSES. Tenders, with complete specifications, pictures and drawings, to Headquarters, Allied Land Forces, South Eastern Europe, P.K. 527 Izmir, Turkey. Attention: Purchasing and Contracting Office. (ESB/3986/58.)

March 6—Australia.—South Australian Railways Commission for the complete power, transmission and control equipment for 24 or 28 DIESEL-HYDRAULIC RAILCARS. Photocopies of tender documents from Export Services Branch, B.o.T., price 36s. (ESB/1748/58)

Export Opportunity—Cuba.—The Trans American Trading Corporation, San Lazaro 906, Havana, Cuba, would like to get into touch with United Kingdom manufacturers of TRANSPORT and CONSTRUCTION EQUIPMENT. (ESB/27371/57.)

The Bushey public library of the Hertfordshire County Council is, until March 1, staging a most interesting display of transport pictures, photographs and other items, many of them obtained with the assistance of the London Midland Region. In addition a special selection of relevant books has been arranged in the lending library.

SHIPPING and SHIPBUILDING

Building Payments Delayed

JAPANESE yards have recently been faced with a number of requests from Greek interests seeking the cancellation of orders already placed, or the re-negotiation of contracts to permit longer periods for payment for vessels under construction. Since the beginning of the year no fewer than 14 such requests have been received from Greece, it is reported, and some of them have been granted. Most are for a change in payment terms from cash on delivery to annual instalments. For example, two 41,400 deadweight ton tankers, one to be completed in September and the other in February, 1959, were arranged at a cost of £58 per ton, paid on delivery. The buyers have now asked Mitsubishi, the builder, to accept 45 per cent of the total cost in two annual instalments and has offered, in return, to raise the cost by 14s. a ton. Government approval is awaited. It has recently been stated in Japan that labour costs are only 44 per cent of those in Britain, but building materials are estimated to cost 162 per cent of the British equivalent.

Inquiry into Ceylon Shipping

THE Ceylon Government has decided to appoint a commission of inquiry to investigate and report on shipping in Ceylon with particular reference to the shipping lines operated by Ceylonese business interests. It was decided to appoint the commission following a case made out by the Minister of Food and Agriculture for the nationalisation of the Ceylon shipping lines. His view was that as long as higher freight rates meant higher profits for the Ceylon shipping lines, it was difficult to see what incentive there could be for the lines to offer the most competitive terms to the Government.

Increased Service to Great Lakes Ports

TWO chartered motorships will be used by the Cunard Steam-Ship Co., Limited, on a new direct cargo service from Liverpool to the Great Lakes ports of Toronto, Hamilton, Sarnia, Cleveland and Detroit, beginning with the reopening to navigation of the St. Lawrence this season. Sailings from Liverpool will be approximately every three to four weeks, the first on March 31. Cunard will now operate four vessels in the Great Lakes service, as in addition to the projected Liverpool departures two chartered vessels will sail periodically from London to Canadian and U.S. Lakes ports in continuation of the services which commenced last season.

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FINANCIAL RESULTS

NOTES on the trading results, dividends and financial provisions of companies associated with the transport industry are contained in this feature, together with details of share issues, acquisitions and company formations or reorganisations.

David Brown Corporation

In the year ended June 30, 1957, the David Brown Corporation, Limited, improved to a net profit of £469,240 (£24,108), after depreciation, but before taxation. Taxation absorbed £291,490, leaving £177,750 (£108).

Mann Egerton

Mann Egerton and Co., Limited, reports group trading profit £242,363 (£175,237) for year ended September 30, 1957. Group net profit is £97,457 (£65,652), dividend 17½ per cent (equivalent). The profit margin in the coachbuilding and engineering departments is small, it is stated.

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TUG RE-ENGINED

(*Continued from page 5*)

1,750 r.p.m. and a maximum static pull at 1,800 r.p.m. of 26 cwt.

The new engine installation has been carried out by Thomas W. Hughan and Company, Woolwich, on transfer of the tug to the South Eastern division, where it is to be used to speed the turnround of vessels using Regent's Canal Dock. This dock, situated on the north side of the Thames at Limehouse, is an important London terminal of the inland waterways and also offers full handling, warehousing and transport facilities for ships up to 300 ft. in length and 45 ft. wide. Regular services are operated from Regent's Canal Dock to many European ports and the direct connection with the canal system permits direct transhipment between steamers and canal craft and through transport by water to and from any point in the country served by the waterways. The use of *Enterprise* for the movement of dumb barges and lighters, which have hitherto been manoeuvred largely by manhandling, will greatly improve the dock working.

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QUADRUPLING G.N. LINE

(*Continued from page 12*)

platform between the two main lines and a new down slow platform will be provided. The present up platform will remain as the up slow platform. The existing buildings at road level and the two existing staircases to the platforms will remain with internal alterations and improvements, including the complete modernisation of the ticket office. A new footbridge and staircase will connect the booking hall with the new down slow platform.

The up and down slow platforms will be provided with new awnings and platform buildings containing waiting-rooms, lavatories and railway staff rooms. The buildings will be centrally heated and washing facilities with hot and cold water will be provided in all lavatories. Additional covered windbreak shelters will be sited in the most convenient positions on up slow and island platforms, but the island at which trains will not normally call will lose its present buildings. The present gas lighting on the station will be replaced by a thoroughly modern installation which will, however, take into account the special character of the neighbourhood, a semi-rural outer suburban district of quiet distinction.

A new diesel-powered arc welding set, Type DEB400U, has been introduced by Quasi-Arc, Limited, Bilston, Staffs, for use where mains electricity is not available. Though robust, it is of light weight and relatively small size and is particularly suitable for depositing the cellulose-covered types of electrode frequently used in positional pipe welding.

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